

COMMERCIAL REFRIGERATION

Fedders Introduces Constant Pressure & Check Valves

(Concluded from Page 1, Column 1)
stainless steel needle and bronze seat. Valve has a drop forged brass body. The check valve assures positive one-way flow of the refrigerant, being used in multiple installations to keep the high pressure gas in the warmer evaporator from backing up into the colder evaporator. It is installed between the outlet of the evaporator and the suction side of the compressor.

Fedders' check valves can be installed in any position, either horizontal, vertical or at any angle. An arrow is stamped in the body of the check valve to show the direction of flow.

Joe Askin, chief engineer of Fedders Mfg. Co., has the following to say concerning the application of the constant pressure valve and the check valve:

"The constant pressure valve and check valve are coming into more general use as the development of refrigeration continues. The owner of a refrigerated walk-in cooler, for instance, can see no reason why the compressor down in his basement should not operate another bit of refrigeration equipment.

"He knows that the machine in his basement is not running all of the time—that it has reserve capacity, and when he is ready for other equipment he wants to use the same com-

Joint Committee Gives Methods for Rating Condensing Units

(Concluded from Page 1, Column 1)
densing unit including the condenser. Therefore, instead of specifying the condensing temperature as in the standard ton, the new method specifies the ambient temperature, the cooling water inlet temperature, and the cooling water outlet temperature.

Proposed Method of Rating Condensing Units

1. A mechanical condensing unit is a specific refrigerating machine combination for a given refrigerant consisting of a motor driven compressor for operation at a given speed, a condenser, a liquid receiver, and the regularly furnished accessories.

2. The power input rating of an electrically driven mechanical condensing unit is its total power input in watts when the unit is operated under the conditions specified in paragraph 4.

3. The capacity of a mechanical condensing unit is the refrigerating effect in B.t.u./hr. produced by the change in total heat content between the liquid refrigerant leaving the condensing unit per hour and the total heat content of the vapor refrigerant entering the condensing unit per hour under the conditions defined in paragraph 4.

4. The capacity rating of a mechanical condensing unit shall be expressed in B.t.u./hr. and/or tons, each of 12,000 B.t.u./hr., and shall be measured under conditions defined as follows:

(a) The unit ratings shall be divided into four standard groups based on refrigerant vapor and cooling water temperatures as follows:

Group No.	Temperatures in Degrees Fahrenheit			
	Saturated	Entering Compressor	In-coming	Out-coming
I	minus 10	65	75	85
II	plus 5	65	75	90
III	plus 20	65	75	90
IV	plus 40	65	75	95

(b) The suction pressure shall be measured at the suction inlet connection to the condensing unit.

(c) The standard ambient temperature for air cooled and/or water cooled condensing units shall be 90° F.

5. The performance factor of a mechanical condensing unit is the ratio of its capacity to its energy input, expressed in B.t.u./watt hr. and/or tons, each of 12,000 B.t.u./hr., per kilowatt.

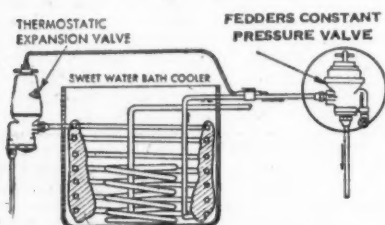
6. The cooling water consumption of a mechanical condensing unit is the total number of gallons per hour required under the conditions specified in paragraph 4.

constant pressure valve will maintain a constant thickness of ice around the coils.

Figure 2 shows a multiple hook-up. The check valve is installed on the suction side to keep the high temperature gas from blowing through the constant pressure valve and entering the low temperature (and low pressure) coil.

A check valve should be installed at the outlet of the low temperature evaporators and a constant pressure valve at the outlet of the higher temperature evaporators.

Figure 1



Constant pressure valve used to keep constant thickness of ice around a beer coil.

pressor if possible. He likes the idea of a central power plant similar to his central steam plant (the furnace), which is used to heat all of his rooms.

"These two valves simplify and aid installations of this type.

"The valves are not only used in changing over old equipment, but also in new multiple installations as well as for many special uses mentioned below.

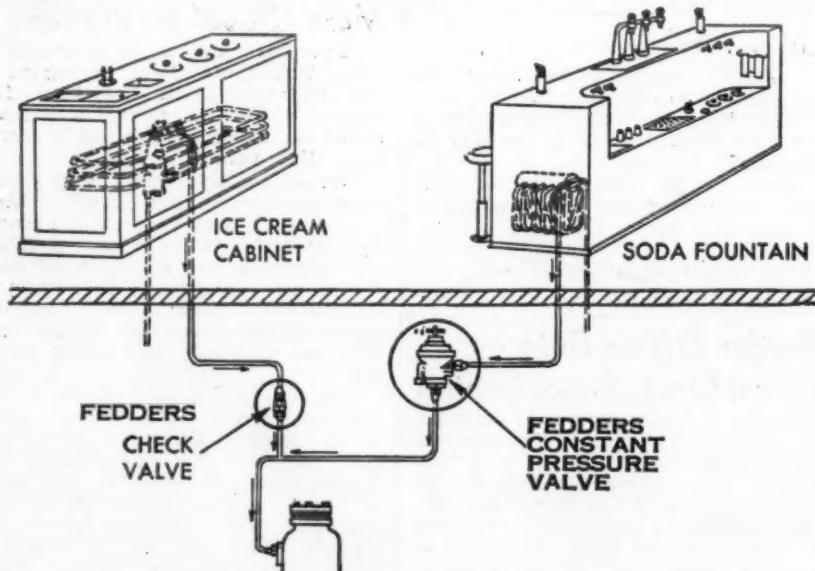
"Many service men and installation men use these valves if for no other reason than as insurance against something going wrong," thus reducing the number of service calls. For example, you may use a check valve between the discharge shut-off valve of the compressor and the condenser.

"This has been done as insurance against the compressor discharge valves leaking, which would ordinarily cause short-cycling. To make this installation would require that a shut-off valve be placed on the receiver near the outlet from the condenser or that the refrigerant be removed from the condensing unit.

"Another special use is to place a constant pressure valve at the outlet of the evaporator on a single coil system."

Fig. 1 shows a beer or water coil immersed in a sweet water bath. A

Figure 2—For Multiple Commercial Job



Check valve is placed at outlet of lower temperature evaporator and constant pressure valve at the outlet of the higher temperature evaporator.

'Army' Ambrose Gets into Action



"Army" Ambrose in his best platform manner as he tells Frigidaire's 1935 story to dealers and salesmen in New York City.

Portsmouth Service Firm Reports Recent Installation Work

PORTSMOUTH, Ohio—Mechanical Refrigeration Service Co., which handles service and installations for refrigeration dealers here, has recently completed the following installations:

Mundhenk's Rheingold Palm Garden, refrigeration for bar, pre-cooler, and bottle cooler, using a 1½-hp. Williams Ice-O-Matic compressor.

Stone's Grill, refrigeration for bar, pre-cooler, bottle cooler, walk-in box, using ½-hp. Ice-O-Matic compressor.

Massie Bros. Market, refrigeration for display cases and wall box; 1-hp. air-cooled Kelvinator compressor.

Thompson's Cut-Rate Market, refrigeration for large walk-in meat box and display case, using Kelvinator compressor.

Malavass Ice Cream Co., refrigeration for ice cream storage cabinet, using a ½-hp. Kelvinator compressor.

Schmidt's Grocery Co., refrigeration for meat storage box, using a 1½-hp. air-cooled Kelvinator compressor.

Portsmouth Candy Co., refrigeration for candy storage room, using two 1-hp. water-cooled Kelvinator units.

B. T. Steward Grocery, refrigeration for display case, using a ½-hp. air-cooled Copeland compressor.

Federal Transient Bureau No. 8, refrigeration for food storage box, using a ½-hp. Copeland compressor.

'Pipe Within a Pipe' Water Cooler Sold In Philadelphia

PHILADELPHIA—First Philadelphia installation of the "pipe within a pipe" construction water cooler was made recently when Judson C. Burns, Inc., Philadelphia distributor for General Electric, sold two water cooler systems to the Philco Co.

Two 90-gal. tanks were installed, water being circulated through outside pipes and returned to tanks through inside pipes. Two G-E CMF-6W condensing units handle the job.

Each system is designed to handle 60 gal. of drinking water per hour.

Westinghouse Conditioner Units Pre-Cool Fruit

LA VERNE, Calif.—For pre-cooling lemons and oranges preparatory to shipment, the La Verne Citrus Association has purchased two Westinghouse air-conditioning units for installation in its cooling plant here. There the fruit is cooled before packing it in refrigeration resulting in marked savings.

Air-conditioning units will supply approximately 33 tons of refrigeration with single and common condensers for the units.

Mills Novelty Builds Addition to Chicago Factory and Offices

CHICAGO—The Mills Novelty Co., manufacturer of counter-type ice cream freezers and hardening equipment, is building a four-story addition to its factory at 4100 Fullerton Ave., and a four-story completely air-conditioned office building, Fred L. Mills, president of the organization, announced recently.

The plant addition will be of modern brick and concrete, daylight and fire-proof construction. The office building will be of structural steel construction. Features include terra-cotta trim, aluminum spandrels in the window construction, and terrazzo floor.

Fogel Introduces 1935 Display Case Line

PHILADELPHIA—Fogel Refrigerator Co. is announcing a new line of commercial refrigerators and display cases for 1935, first models of which are scheduled to come off the production line about March 1.

In addition to streamlining, the new models have an improved system of baffles. Cold air circulation is so directed that there is a natural down-flow of air, and conflict of warm and cold air currents is eliminated.

Other improvements include an automatic diffusion shelf, which directs cold air underneath the shelf as well as above it; larger rubber sliding doors; more glass display; modernistic hardware and fittings; all-porcelain exterior and interior; and added insulation.

Kelvinator Cooler Used to Store Foxes' Food

CHEYENNE, Wyo.—A Kelvinator-refrigerated walk-in cooler was recently installed by the Cheyenne Light, Fuel & Power Co. for the Cheyenne Silver Fox & Fur Ranch, where approximately 600 silver foxes are being raised. F. W. Fitch sold the unit.

The meat fed to the foxes is kept in condition in the 9x13-ft. cooler, which is cooled by two FC-163 forced convection units operating from an RB-230 Kelvinator condensing unit.



2 Horse Power Century Type RS, Single Phase, Repulsion Start Induction Motor

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All the exacting requirements of Air-Conditioning, Ice Cream Manufacture and Storage, Meat Refrigerators, Display Cases, etc., are conspicuously met by Century Motors—high starting torque—low starting current—frequent starting and stopping—automatic control—continuous dependability—long life... Up to 40 H. P.... Consult Century Engineers.

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REFRIGERATION NEWS

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Dealers Adopt Financing Plan In Louisville, Ky.

Utility and Finance Firms Cooperate with Dealers On FHA Program

LOUISVILLE—Electric refrigerator dealers and distributors of Louisville have agreed on a three-cornered plan for cooperating with the Federal Housing Administration in its program to enable property owners to procure improvements at low cost.

Cooperating with the dealers and distributors in the plan are the financial institutions of Louisville and the Louisville Gas and Electric Co.

The plan, evolved by the financial organizations and the utility company, will enable the purchase of refrigerators by allowing the buyers to make small monthly payments over a long period of time.

In brief, the plan follows: the purchaser selects the type of electric refrigerator he desires from any reputable dealer and signs the credit statement and a note required by the government. The note is then taken over by one of the financial institutions which pays the dealer in full.

The buyer is then permitted to make his monthly payments on the electric refrigerator with his electric bill to the Louisville Gas and Electric Co. The company, in turn, turns the money over to the financial institutions holding the note.

The Federal Housing Administration notes used in the plan provide for payments as low as \$3.20 a month—according to the price of the refrigerator bought—and allow the payments to be extended over a thirty-six months period.

Larkin Introduces New Beer Cooler

ATLANTA—Larkin Refrigerating Corp. of this city last week introduced its new Dual-Control liquid cooler, a low-pressure system which is claimed to cool beer to any desired temperature with a variation of only 1° F. and with a capacity to meet varying load demands.

In making the announcement about the new liquid cooler, Lester U. Larkin, vice president and general manager, declared that the product is only one of several developments that Larkin will introduce in an enlarged manufacturing program this year.

According to Mr. Larkin, the Dual-Control beverage cooler can be used in multiple installations without two temperature valves, even with an ice

G-E Urges Sale of Lifting by Utilities

CLEVELAND—P. B. Zimmerman, manager of General Electric Co.'s specialty appliance sales department, urged executives of the Associated Gas & Electric Co. to give more serious consideration to building up the minimum bill, or unprofitable customer, by merchandising G-E "Lift-off" refrigerators, in addressing the utility men, who held their annual spring sales convention at Nela Park last week.

"Utilities must continue to merchandise refrigerators aggressively in their load-building programs," Mr. Zimmerman said, "and the new low-priced 'Lift-offs' offer one of the greatest opportunities for increasing the use of electricity by small-income families."

"The great majority of these families," Mr. Zimmerman said, "prefer electric refrigerators above everything else, but have been prevented from buying because of cost. Now, in chest-type refrigerators, an ideal new instrument of electric service has been developed for this customer, which gives him the full benefit of electric refrigeration at a price he can afford to pay, at one-half the cost of operation, and one-half the cost of maintenance."

Urging creation of an acceptance of new things if business and employment are to increase, he stressed the importance of the Federal Housing

(Concluded on Page 11, Column 1)

Small, Low-Priced Cabinets Built By Seeger

ST. PAUL—Seeger Refrigerator Co. is introducing two new cabinet models for 1935, of 4 and 6-cu. ft. net capacities, for small homes and apartment houses in the low-price refrigeration market.

The cabinets are distinctively styled, with exterior finish in Dulux and interior in one-piece, acid-resisting porcelain. Hardware is chromium-plated.

Smaller of the two models, known as the 24-47 Special Four, has a net food storage capacity of 4 cu. ft. and a shelf area of 8.42 sq. ft. Overall dimensions are: height 52½ in., width 23½ in., and depth 20½ in. Interior of the food compartment is 26½ in. high, 19½ in. wide, and 15½ in. deep.

Two inches of insulation is provided in the sides, back, top, and bottom of the cabinet, and 2½ in. in the door.

The larger model, called the 31-52 Special Six, has a net food storage capacity of 6.07 cu. ft. and a shelf area of 12.35 sq. ft. The cabinet is 58½ in. high, 30½ in. wide, and 22½ in. deep, and the food compartment interior is 31 in. high, 24½ in. wide, and 16 in. deep.

In this model, 3 in. of insulation is provided in the sides, back, bottom, and door, and 2½ in. in the top.

Shelves on both models are of the flat wire bar type, with the front section of the lower shelf removable. Storage space for tall bottles is provided on either side of the cooling unit, which is designed to be placed in the top center of the compartment.

Ice Cream Drive Nets \$250,000 in Orders For Kelvinator

DETROIT—Orders for commercial refrigeration equipment on ice cream handling applications totaling approximately \$250,000 were secured by a crew of eight Kelvinator commercial specialists, under the direction of Edward R. Legg, manager of the national business division, in a sales drive carried out during the last week in January.

Among the business obtained was an order for more than 100 condensing units to be used in connection with refrigerated trucks.

New 'Service Section' to Be Added To 1935 Refrigeration Directory

Delivery of Volume I of the 1935 REFRIGERATION DIRECTORY AND MARKET DATA BOOK will be delayed somewhat due mainly to the addition of a new "Service Section." This section will contain the names of replacement parts jobbers and an extensive list of independent service companies, also several other lists of non-manufacturing organizations which specialize in service to the refrigeration and air-conditioning industries.

Original plans called for the publication of a list of independent service companies in the 1935 DIRECTORY but difficulties were encountered in securing an adequate list of reliable companies who are equipped to take care of service on all makes of electric refrigerators. Several new sources of information were investigated and it is now believed that the list to be published will be quite dependable and representative of this new branch of the industry. The aim has been to provide a list of independent service men who may be called upon for emergency service by manufacturers and distributors who need to take care of repair calls in communities where a particular manufacturer or distributor may not have an authorized dealer.

The 1935 REFRIGERATION DIRECTORY will list all manufacturers of refrigeration and air-conditioning equipment; materials, parts, and supplies in four different ways, the same as in previous DIRECTORIES. There will be an *Alphabetic Index* giving the name and address of every manufacturer, a *Trade Name Register* which will list all trade names of refrigeration and air-conditioning equipment, parts, materials, and supplies. This list will include the trade names of closely

related products such as oil burners, washing machines, vacuum cleaners, etc. The trade name list is not limited to refrigeration products being actively distributed at the present time, but also includes the names of units formerly made by companies which are now defunct or which have discontinued production.

In the *Geographic Directory*, all manufacturers are listed with address, telephone number, official personnel, and a summarized list of products. The *Classified Products Section* has been re-arranged so as to make it more convenient for buyers to locate sources of supplies. Products have been grouped into major divisions such as air conditioning, beer and beverage cooling, commercial and industrial refrigeration, dairy, ice cream and soda fountain equipment, household refrigerators, electric motors and controls, parts, materials, and supplies.

The contents of the 1935 REFRIGERATION DIRECTORY, which will appear shortly, will bear only a slight resemblance to previous editions. Corrections, additions, and deletions in the listings are so numerous that it was found necessary to completely re-set all of the type matter. The 1935 edition is therefore an entirely new book from start to finish.

Volume II, the 1935 REFRIGERATION MARKET DATA BOOK, will not be ready for delivery until about April 1. This book will also contain extensive compilations of new data. All of the charts and tabulations of statistics for past years are being completely revised and re-arranged so as to provide, in most convenient form, all available facts and figures regarding

(Concluded on Page 10, Column 5)

Norge Enters the Show Business



Not content with manufacturing refrigerators, stoves, washing machines, and oil burners, Norge Corp. has been producing five-act dramas in principal cities all over the nation during the last few weeks. Thus thousands of consumers have been drawn into distributor-dealer meetings to see the 1935 Norge line. This picture shows a crowd waiting to get into a theater in Nashville, Tenn., and also shows how the play was advertised by Dixie Maytag Corp., Norge distributor.

175,000 Prospects See Norge's Play in 65 Cities; Return Engagements Planned

DETROIT—Norge's five-act play, "The Freedom of the Shes," performed by two troupes of professional actors, is nearing the close of its run after having shown in 65 American cities to audiences aggregating approximately 175,000 people.

High spot on the home stretch was reached on Feb. 28, when both troupes met in Chicago for morning, afternoon, and evening performances at the Auditorium theater before 10,000 Chicago housewives.

The show, produced by Norge Sales Promotion Manager James A. Sterling, has been requested for re-booking by so many distributors that the troupes, after a two-week rest, will start out on another schedule of supplemental cities.

Presentation of the show, which Norge executives call an experiment

in "painless" selling, was a cooperative affair, with Norge furnishing the program, and the distributor the audience and the theater. The home office sent out a 10-section bulletin, covering instructions on everything from props and equipment to the follow-up procedure.

A factory promotional program of invitational mailings, programs, envelope stuffers, attendance tickets, posters, radio skits, advertising mats, and publicity was also made available to distributors and dealers.

The troupe touring the eastern section of the country was led by Sales Manager John Knapp, while Jim

(Concluded on Page 2, Column 1)

Judge Grubb Annuls TVA Power Contract

BIRMINGHAM, Ala.—A contract between the Tennessee Valley Authority and the Alabama Power Co., providing for transfer of the utility's transmission lines in northern Alabama, will be annulled in its entirety, U. S. District Judge W. I. Grubb said last Friday.

Power interchange agreements under which the TVA supplies current to towns in Mississippi, Alabama, and Tennessee will also fall under the decree he is preparing to sign.

Last week Judge Grubb, in an oral decision, held that the TVA was without authority to sell surplus power generated at the huge war-time hydroelectric plant at Wilson Dam and at other dams now under construction.

Friday's conference was held to

(Concluded on Page 2, Column 4)

Frohlich Will Manage Norge Sales in N. Y.

NEW YORK CITY—E. L. Frohlich, for the past five years Brooklyn sales representative of Norge Corp., has been promoted to the sales manager-ship of the company's New York branch, according to an announcement by A. D. McCaughna, general manager of Norge Corp. of New York.

Mr. Frohlich will supervise Norge sales in Manhattan, Bronx, Richmond, Queens, and Kings boroughs, and in Suffolk, Fairfield, Westchester, Rockland, and Orange counties.

Other additions to Norge's sales staff here include Tom Ward, formerly of Maytag and the 1900 Washer Mfg. Co., who will assist dealers in washer and refrigerator sales in the territory formerly held by Mr. Frohlich; and Bill Clark, formerly of Rex Cole, Inc., General Electric distributor, who will also be stationed in the Brooklyn sales division.

Air-Cooled Unit Used for York's New Conditioner

Portable, Self-Contained Model Vents Heat To Outdoors

YORK, Pa.—Portable and air cooled so that no water connections are required, a new self-contained air conditioner has just been announced by William S. Shipley, president of York Ice Machinery Corp.

A special feature of the new unit is its provision for positive introduction of fresh air into the conditioned space.

With all elements incorporated inside a stylish cabinet, the unit provides for cooling, dehumidifying, cleaning, circulating, and freshening air in a room.

The cabinet exterior was designed by a professional stylist of New York City, and was selected from several designs submitted to a vote among architects, department store buyers, professional people, and York employees. It is finished with walnut panels and satin chrome trim.

The conditioner is designed to be placed beside a window, and has a telescopic duct connection in the rear from which outside air is drawn for

(Concluded on Page 16, Column 4)

Commercial Groups Name Committee

CHICAGO—A joint Committee on Commercial Refrigeration—consisting of representatives from the Commercial Refrigeration Manufacturers Association, the Refrigeration Division of National Electrical Manufacturers Association, and the Refrigerating Machinery Association—has been established to give consideration to problems of mutual interest to members of the three associations.

Two members have been elected from each organization to serve on the joint committee and a meeting will be held in the near future at which policies needed to establish a bond of cooperation between the commercial cabinet and the commercial machine fields will be considered.

Representatives for the Refrigerating Machinery Association are C. A. Pearson, York Ice Machinery Corp., and J. M. Fernald, Baker Ice Machine Co.

Members of the new committee for the Commercial Refrigerator Manufacturers Association are W. C. Whit-cher, the "Dry-Kold" Refrigerator Co., Niles, Mich., and H. C. Ahrens, C. Schmidt Co., Cincinnati.

Representatives of the Refrigeration Division of Nema are J. A. Harlan, Kelvinator Corp., and Walter Landmesser, General Electric Co.

Elimination of Part-Time Salesmen Sought by Birmingham Dealers

BIRMINGHAM, Ala.—Complete elimination of the part-time refrigerator salesmen as rapidly as possible has been recommended by a committee of the Birmingham Refrigeration Bureau of which John Shaw, president, is chairman.

If part-time salesmen are used at all the committee recommends that dealers pay them only 5 per cent commission and that the difference between that and the regular commission of 10 per cent to full-time salesmen be given to the latter. The committee also decided that any sales by part-time salesmen should be credited to the yearly and monthly quotas of the regular salesmen.

Under the committee's plan dealers have the option of paying full-time salesmen either a 10 per cent basic commission, plus 2 per cent for making monthly quota, plus 1 per cent for making yearly quota or else a straight 12 per cent commission to salesmen who have demonstrated their earning ability.

On an estimated annual quota of \$12,000 retail price, the salesman would earn under the compensation plan suggested a total of \$1,560 per year, provided he earned all monthly and yearly bonuses.

5,400 See Dallas Performance Of Norge's 5-Act Play

(Concluded from Page 1, Column 3)
Sterling was in charge of the troupe visiting western cities.

Attendance Record

Attendance records were established in several cities during the run. In Dallas, 5,400 women sat through the show in the State Fair Auditorium, poorly heated, on the day after a sudden drop of temperature from 84 to 60°. Scheduled to go on at 10 a. m., the Norge troupe arrived at 8:30, with scenery which had to be hauled to the theater, two miles away.

For an hour and a half, Mr. Sterling and his aides held the audience with impromptu acts. It was so cold that grease froze in the orchestra's instruments, and Billy Hammond, xylophonist, had to have her arms rubbed for half an hour before she was able to perform. The orchestra displayed its versatility by giving an imitation of a little German band.

4,000 at St. Louis Show

In St. Louis, the Norge Co. of Missouri reported attendance of 4,000 at its show, with tickets by invitation only to prospects and users within a 35-mile radius. The local utility also cooperated in making tickets available to its patrons. The company reports its business for the year to date is 287 per cent above the same period of last year, in billings and actual deliveries.

Attendance at Baltimore, at the show sponsored by Jos. M. Zamoiski Co. in the Auditorium theater, was estimated at 1,500 persons, despite the fact that it was held on a Monday, in sub-zero weather.

Three thousand housewives were at the Philadelphia show, given by

Ludwig Hommel & Co. Attendance at the dealer-salesmen banquet after the performance was estimated at 800.

Birmingham Electric Battery Co., sponsors of the performance in Birmingham, Ala., reported a capacity crowd of 3,280. In New York City, Norge Corp. of New York held two showings, the first for dealers and their prospects only, and the second, an afternoon show, in cooperation with the *New York American*. Upwards of 3,500 people attended.

1,200 Refrigerators Sold

Attendance at the showing in Louisville, Ky., was estimated by the Sutcliffe Co., Norge distributor there, at 1,700. Moser & Suor, Kansas City, who staged the show in Kansas City and Wichita, reported packed houses in both cities. The distributor's January sales totaled approximately 1,200 refrigerators.

In the crowd at the Denver performance, sponsored by Auto Equipment Co., were 22 prospects brought in by J. M. Hubbard of the Valley Radio Sales & Service of Del Norte, Colo., a distance of 280 miles. The banquet after the show was attended by 243 dealers and salesmen.

At the Denver show, an unusual and humorous incident occurred.

In the Anthony and Cleopatra skit, Anthony, having decided to commit suicide over his inability to meet Cleo's demand for home appliances that cannot be produced for 20 centuries to come, spews the grapes he has been eating all over the orchestra. Finally, in desperation, the boys in the pit hoisted umbrellas at the crucial moment, stopping the show.

Although given only five days'

notice, Ralph E. Dunn, manager of the Tulsa branch of Brown Electric Co., Oklahoma City Norge distributor, filled the municipal auditorium with 3,500 women for the show, and had the mayor deliver an introductory speech.

The slanting stage of the Tulsa auditorium, which had once sent one of the Marx Brothers hurtling off the platform and into a bass drum in the orchestra pit, was also a problem to the Norge players, especially to Actor Jack Marvin, who swayed perilously from a high stool in one part of the show.

500 Turned Away

Dixie Maytag Corp. at Nashville, Tenn., reported an attendance of 1,800 at the show, with 500 additional people turned away. Capacity of the theater was only 1,300. Three new dealer accounts in Nashville have been added as a result of the performance there.

At Salt Lake City (The Sale Lake Hardware Co.), "The Freedom of the Shes" played to an audience of 1,800 people; at Jackson, Miss. (Cabell Electric Co.) to 1,100; at Buffalo (W. Bergman Co., Inc.) to 1,500, with 500 turned away; at Charlotte, N. C. (A. K. Sutton, Inc.) to 1,500; at Indianapolis (The Gibson Co.) to 1,800, with 500 turned away.

In Portland, Ore., the North Coast Electric Co., distributor, reported its showing was attended by 4,500 people, with 2,000 more for whom seats were unavailable. Tidmarsh Engineering Co., which sponsored showings at Tuscon and Phoenix, Ariz., estimated the attendance figures for the meetings at 1,500 and 1,700, respectively.

Columbia Wholesalers, Inc., distributor in Washington, D. C., reported that, with newspaper cooperation, in excess of 3,000 tickets were distributed.

B & O Radio, Inc., distributor at Newark, reported 2,317 in attendance at the showing there, with 17 bus loads brought in by dealers from dis-

Crowds Wait in Line for Norge Show



Extra policemen were needed to direct traffic when 1,500 attended the performance of the Norge play in Tuscon, Ariz.

tant points. The Hackensack dealer brought in 150, and the Perth Amboy dealer, 60.

Local Radio Advertising

Individual distributors contributed to effectiveness of the shows, many of them with spot radio announcements and the offering of special prizes to dealers and prospects who traveled the greatest distance to be present, or to winners in a special drawing at the end of the program.

Newspapers, among them the *Seattle Post-Intelligencer*, the *Wichita Beacon*, *Portland Morning Oregonian*, *Washington Herald*, *Baltimore Post*, and *Milwaukee Journal*, devoted considerable space to publicity notices concerning the show, some of them getting out special Norge editions at the behest of the distributor.

Editorial mention on the program is estimated in excess of 250,000 lines.

Judge Will Annul TVA Power Contracts

(Concluded from Page 1, Column 4)
work out the final decree. Present, in addition to Judge Grubb, were attorneys for the TVA and Forney Johnston, representing the group of Alabama Power Co. preferred shareholders who asked an injunction against the government agency.

At the conference, the judge announced he would annul the TVA's contract with the power company as well as the agreement for the interchange of power. The TVA has been serving a number of southern towns with current through an interchange agreement with the Alabama Power Co.

Attorneys suggested that a period of four months be allowed for TVA to work out a plan of withdrawal from competition with the Alabama Power Co., and to permit towns and areas served by TVA to make contracts for obtaining electric energy elsewhere.

Judge Grubb held today that the TVA is entitled to the site of Joe Wheeler Dam (now nearly half completed, and located 15 miles above Wilson Dam), and ruled that it was legally built. Purchase price of the dam, however, is involved in the contract that the judge held void.

Attorney Johnston suggested that the price for the dam site be worked out in negotiations, or that the government condemn the property, if other means of obtaining it failed.

200 Attend G-E Meeting In Louisville

LOUISVILLE — Two hundred salesmen and dealers attended the annual sales convention here of the Thompson-Sterling Co., distributor of General Electric products in the Louisville territory. M. E. Brown, president of the company, was the principal speaker.

Senator Claims TVA Uses Funds for Propaganda

WASHINGTON, D. C. — Evidence that the Tennessee Valley Authority, using Federal funds, is disseminating public ownership propaganda in the public schools, was introduced by Senator L. J. Dickinson of Iowa, in a recent speech on the U. S. Senate floor.

"Recently I was astounded to discover the broadcast manner in which TVA's socialistic doctrines are being spread in the very same underhand manner of which public utilities have been accused, and which I was among the first to deplore," Senator Dickinson said.

"I refer to an article entitled 'Tennessee Valley Looks to the Future,' which appeared in the *Journal of the National Education Association* of December, 1934."

Senator Dickinson explained that Walter E. Myer, editor of the *American Observer*, was paid for writing the article by the TVA, in whose employ he spent several weeks.

"The deception lies in the fact that the readers of this article—and it has been reprinted for classroom use, large quantities having been purchased for free distribution by TVA—are forced to assume that the writer has written freely from his own observations. The article is written, of course, purely from the standpoint of those who want to make everything look rosy in the TVA," the senator said.

Senator Dickinson quoted from the article as follows:

"They (the utility companies) seek to influence public opinion in so far as it relates to the regulation of utility rates. They carry their influence to the schools and secure the adoption of textbooks which are favorable to utility companies, and the elimination from other textbooks of statements they consider harmful."

"This," Senator Dickinson commented, "from a piece of propaganda performing the same kind of mendacious dissembling."

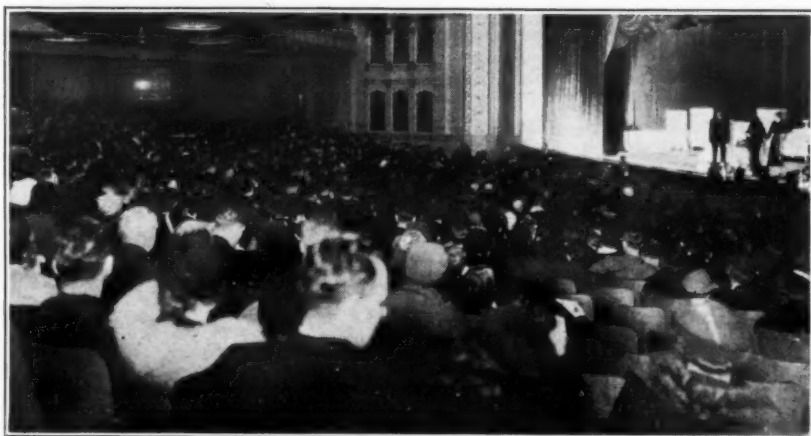
The senator also introduced a personal message from Dr. Joy Elmer Morgan, editor of the journal in which the article appeared, to the school teachers of the country, urging them to try the Myer article on their classes.

"Perhaps it will help our young to realize that America has a great future, if it wills to have such a future," Dr. Morgan wrote.

Cutler Will Direct Norge Commercial Sales in N. Y.

NEW YORK CITY—M. E. Cutler, formerly commercial manager of the New York branch of Frigidaire Corp., is now commercial sales manager of Norge Corp. in New York.

One Packed House after Another



A large number of men were in the audience when the curtain rose on "The Freedom of the Shes" at Oklahoma City.

Copeland

DEPENDABLE ELECTRIC REFRIGERATION



Copeland Model No. 955, 8.7 cubic feet (net)

1935 Copeland Refrigerators

Refrigeration at its best is fully exemplified in the 1935 Domestic line of Copeland. Simple, yet graceful in appearance, the lustrous white cabinets, trimmed with chrome-plated hardware, enable the distributor to furnish dependable electric refrigeration at minimum cost to the public.

There are four sizes in the 1935 line. 4.5, 5.5, 6.6 and 8.7 cubic feet net storage capacity.

Copeland porcelain clad evaporators, nine freezing speeds, black lacquer bases, abundant ice cube capacity, rubber tray and electrically illuminated interiors are some of the features.

Condensing units is bottom mounted and with many recent improvements is the time-tested unit which has served so many thousands of Copeland users.

Some distributing territory is now being allotted to responsible organizations. Join up with Copeland for PROFITS in 1935.

COPELAND REFRIGERATION CORPORATION, Detroit, Mich.

Main Office and Factory: Holden Ave. at Lincoln

Division of Dallas E. Winslow, Inc.

9 BRAND NEW MODELS

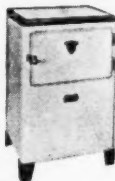
2 TABLE SHELVADOR MODELS

TABLE SHELVADOR

FR-20—2 cu. ft. NET Capacity. Semi-hermetic Rotary Compressor. Dimensions: 36" high, 23½" wide, 25" deep. (Shown at left). **\$79.50**

TABLE SHELVADOR

FR-30—3.1 cu. ft. NET Capacity. Rotary Compressor. Same dimensions as FR-20. **\$94.50**



4 SHELVADOR MODELS

SHELVADOR MODEL FA-40

4.09 cu. ft. NET Capacity. 8.6 sq. ft. shelf area. 2 ice trays—42 cubes. Dimensions: 52¼" high, 23½" wide, 25½" deep. **\$112.50**

SHELVADOR MODEL FA-60

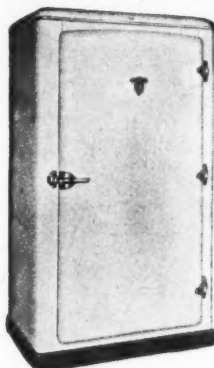
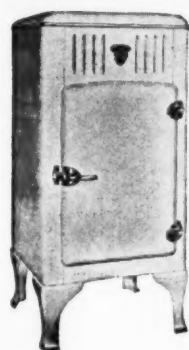
6 cu. ft. NET Capacity. 13.5 sq. ft. shelf area. 3 ice trays—63 cubes—one double-depth tray. Dimensions: 56¼" high, 30¾" wide, 25½" deep. **\$149.50**

SHELVADOR MODEL FA-50

5 cu. ft. NET Capacity. 11.3 sq. ft. shelf area. 2 ice trays—42 cubes—one double-depth tray. Dimensions: 56¼" high, 25½" wide, 24½" deep. (Shown at left). **\$129.50**

SHELVADOR MODEL FA-70

7.08 cu. ft. NET Capacity. 14.9 sq. ft. shelf area. 4 ice trays—84 cubes—one double-depth tray. Dimensions: 57½" high, 32¾" wide, 25½" deep. **\$169.50**



3 TRI-SHELVADOR MODELS

Models FA-50, FA-60, FA-70, and all Tri-Shelvador Models also available with porcelain exterior at slight extra cost.

TRI-SHELVADOR MODEL F-43

4.3 cu. ft. NET Capacity. 9.15 sq. ft. shelf area. 2 ice trays—42 cubes—one double-depth tray. Dimensions: 56½" high, 23½" wide, 23½" deep. **\$139.50**

TRI-SHELVADOR MODEL F-55

5.51 cu. ft. NET Capacity. 11.6 sq. ft. shelf area. 3 ice trays—63 cubes—one double-depth tray. Dimensions: 57½" high, 29" wide, 24½" deep. **\$164.50**

TRI-SHELVADOR MODEL F-70

7.08 cu. ft. NET Capacity. 14.9 sq. ft. shelf area. 4 ice trays—84 cubes—one double-depth tray. Dimensions: 58½" high, 32¾" wide, 25½" deep. (Shown at left). **\$189.50**

Crosley Tri-Shelvador Adds 3 Exclusive Features to Famous Shelvador

The Tri-Shelvador has all the features of the Shelvador, with the following added exclusive features:

- 1—SHELVATRAY. Handy shelf in door that drops to horizontal position. Place articles on Shelvatray and carry them (Shelvatray and all) to table, range, or cabinet. Saves time and steps. (Patent Pending.)
- 2—SHELVABASKET. A non-refrigerated basket on bottom of door for greens, carrots, cabbages and the like. An exclusive feature. (Patent Pending.)
- 3—STORABIN. A non-refrigerated bin in bottom part of cabinet for potatoes, onions, and other bulk items. Found only in Tri-Shelvador. (Patent Pending.)

In addition: Self-closing stainless steel door to freezing chamber in all Tri-Shelvador Models.

EXCLUSIVELY IN
CROSLEY
ELECTRIC REFRIGERATORS



*This much more
in a
Shelvador*



THIS much more . . . twice as easy to find . . . the all-time high-point in electric refrigerator convenience . . . smartness that excites exclamations everywhere! No wonder sales are going up! up! UP!

Shelvador—the electric refrigerator showing the greatest sales growth during 1934—will make new sales history during 1935. For SALES are written all over these amazing models that meet every viewpoint, every purse.

When you sell EXCLUSIVE features, you sell something beyond the reach of competition. And the 1935 Crosley line is exclusive, not only in features, but in Streamline Beauty and in foot-saving convenience. Far ahead in value. The prices speak for themselves. Get in touch with your Crosley distributor, so that you may begin now to make 1935 your biggest year. You can't afford NOT to handle Crosley.

THE CROSLEY RADIO CORPORATION

(Pioneer Manufacturers of Radio Receiving Sets)

Home of WLW—the world's most powerful broadcasting station.

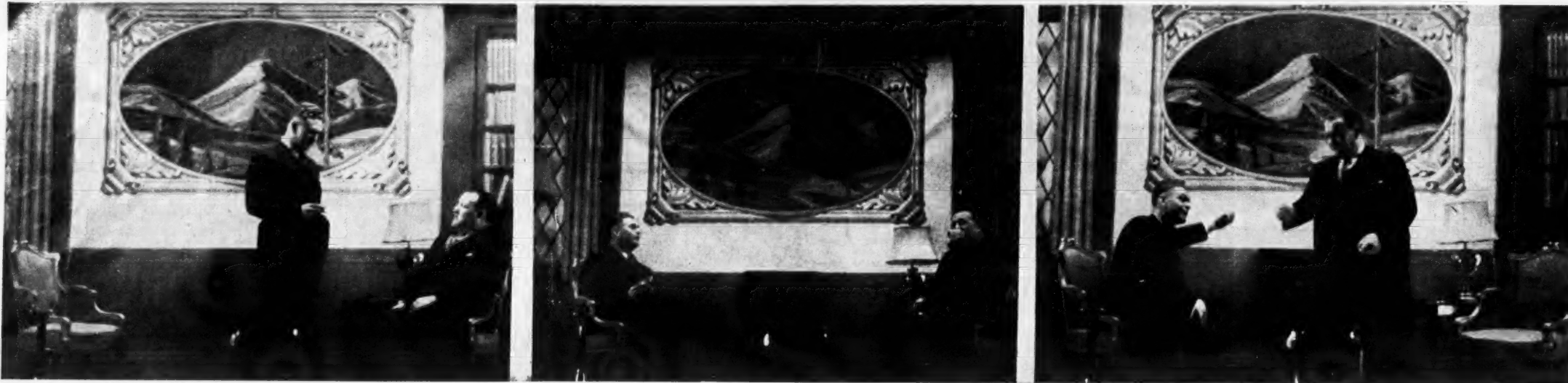
POWEL CROSLEY, Jr., President

CINCINNATI

Western prices slightly higher.

ALL PRICES INCLUDE DELIVERY..INSTALLATION..ONE YEAR FREE SERVICE

Air-Conditioning Sales Methods Taught to Frigidaire Dealers by Playlet



How to get more air-conditioning business was demonstrated dramatically to Frigidaire dealers all over the land during February by a playlet in which a crack Frigidaire field man makes a sale. These performance photographs of the playlet were taken at the New York City meeting by the editor of the News.

BOOKS

America's Capacity to Consume

Authors: Maurice Leven, Harold G. Moulton, and Clark Warburton. Publisher: The Brookings Institution, Washington, D. C. Pages: 255. Price: \$3.00.

THIS is the second of four volumes devoted to an analysis of the

relation of the distribution of national wealth and income to economic progress.

"America's Capacity to Consume," is an analysis of "the flow of income arising out of our productive operations."

"It is this income which determines the capacity of the people to purchase the consumption goods which are annually produced, and also to provide the savings which are essential to the formation of new capital."

The authors have drawn certain basic conclusions from the information and analyses contained in this and the preceding volume, "America's Capacity to Produce." The study in both volumes was based on conditions during the first 30 years of this

century and does not include, except incidentally, the depression period.

The six chief conclusions drawn by the authors are as follows:

1. "During the so-called 'new era' of the gay twenties the United States was not living beyond its means." The authors state that their findings show that the nation as a whole was not living beyond its capacity (as measured by what the country could produce), although individuals may have been living beyond their individual means.

2. "There has been a tendency, at least during the last decade or so, for the inequality in the distribution of income to be accentuated." The authors explain that although the incomes of the masses of the people

rose during this period, the incomes of those in the upper income brackets were increased with greater rapidity, creating greater inequality still.

3. "Vast potential demands, alike for basic commodities and for conventional necessities, exist in the unfulfilled wants of the masses of the people, both rural and urban."

Surveys of family expenditure made by the authors show that at each successive income level the expenditures of these families and of unattached individuals increase. Thus, the authors aver, if the incomes of those in each income group could be lifted to the next higher group their expenditures would be increased.

"Even in lines of basic necessities great wants among the masses of the people still go unsatisfied. The trouble is clearly not lack of desire but lack of purchasing power." The unfulfilled consumptive desires of the American people, conclude the authors, are large enough to absorb a productive output many times that achieved in the peak year 1929.

4. "The United States has not reached a stage of economic development in which it is possible to produce more than the American people as a whole would like to consume."

Figures taken from the survey made are used to illustrate this; "Raising all family incomes below \$2,500 to \$2,500, with no changes above that level, would increase actual consumption by more than 16 billion," and "Adding \$1,000 to every family income below \$10,000 would increase consumption by about 27 billion."

5. "We cannot materially shorten the working day and still produce the quantity of goods and services which the American people aspire to consume."

The authors believe that a 30-hour working week, with complete utilization of labor force and productive establishment (and assuming a universal increase in efficiency in industry of as much as 25 per cent), the productive output would still be considerably smaller than in 1929 when the working week was 51 hours.

6. "In emphasizing the need of increasing consumption, we must not forget the necessity of simultaneously expanding production . . . Whether we live under a wage, price and profit system, or under a completely communistic method of economic organization, it will always be true that the level of consumption or the standard of living can be raised only through the production of food, clothing, shelter, comforts, and luxuries."

Kowfeldt Will Be Agent For Starr-Freeze Line

MINNEAPOLIS—The Kowfeldt Co., 529 Seventh St., South, has been appointed manufacturer's agent for the distribution of Starr-Freeze commercial and domestic refrigeration equipment in western Wisconsin, Minnesota, and North and South Dakotas. G. C. Kowfeldt is the traveling representative of the company in charge of Starr-Freeze sales.

3 Western Dealers Add Crosley Line

SALT LAKE CITY—General Department Stores at Logan, Utah, and Preston, Idaho, and the Axelrad Furniture Co. of this city have been selected dealers for Crosley electric refrigerators, reports H. N. Eskuche, manager, Western Supply Co., Crosley distributor at Salt Lake City.

Hagerstown Dept. Store Made Crosley Dealer

HAGERSTOWN, Md.—Eyerly's Department Store of this city has been appointed dealer for Crosley electric refrigerators by the Lincoln Sales Corp., Crosley distributor for Baltimore, reports Walter Cleland, manager of refrigerator sales for the department store.

Burritt & Kent Speak At Schneiderhahn's Dealer Meeting

DES MOINES—A. A. Schneiderhahn Co., distributor for Leonard refrigerators, Atwater Kent radios, and ABC washers, held its annual dealer meeting recently at the Hotel Fort Des Moines.

H. W. Burritt, vice president of the Leonard Refrigerator Co., and A. Atwater Kent, Jr., vice president of the Atwater Kent Mfg. Co., spoke at the electrical appliance meeting.

Other speakers included G. Strelinger, general sales manager, Sam C. Mitchell, advertising and sales promotion manager, and George B. Gray, district sales manager, all of the Leonard Refrigerator Co.; C. M. Armstrong, vice president of Refrigeration Discount Corp.; and George Jaud, district sales manager of the Atwater Kent Mfg. Co.

Bucher Elected Vice Pres. Of Westinghouse

NEW YORK CITY—George H. Bucher, president and general manager of the Westinghouse Electric International Co., was elected a vice president of the Westinghouse Electric & Mfg. Co. at a meeting of the board of directors of the organization last week. His headquarters will be in New York City.

Mr. Bucher has been connected with the Westinghouse organization since his graduation from Pratt Institute, Brooklyn, in 1909, joining the company as a graduate student. In 1911 he was transferred to the export department in New York City, and in 1920 was appointed assistant to the general manager of the Westinghouse Electric International Co., becoming assistant general manager the following year.

He was advanced to the position of vice president and general manager of the company in 1932, and in 1934 was elected its president.

He is a member of the American Institute of Electrical Engineers.

Hast Leaves May for Emerson Radio Corp.

NEW YORK CITY—Nate Hast, until recently vice president in charge of sales for May Radio & Refrigeration Corp., has left that position to become eastern sales manager for the Emerson Radio & Phonograph Corp. Mr. Hast is a veteran in radio, retailing, having been with Philco and other firms in the radio industry.

EARNINGS

Servel, Inc.

Servel, Inc., and subsidiaries in the quarter ended Jan. 31 had loss of \$215,202, against loss of \$402,855 in the like period of the preceding fiscal year.

Sparks-Withington

Sparks-Withington Co. and subsidiary in the six months ended Dec. 31 had net loss of \$148,977, against net loss of \$164,456 in the like 1933 period.

McCord Radiator

For the year ended Dec. 31 net loss was \$27,509 against net income of \$24,757 in 1933.

Armstrong Cork

Net income of Armstrong Cork Co., including domestic subsidiaries and operating results of foreign subsidiaries for 1934 was \$1,973,098, against \$2,386,714 in 1933.

No "slacks or slumps" when you sell WILLIAMS ICE-O-MATIC

—and now we add
2 brand new domestic lines!

NO slow seasons when you sell Williams Ice-O-Matic. For prices and profits, just in the domestic selling seasons alone, our two brand new Ice-O-Matic household lines will open your eyes. You are put right up in the forefront with our new De Luxe line and can sell a lion's share of popular-priced models with our new Standard line.

Then all year round you have a paying commercial refrigeration business because Williams Ice-O-Matic equipment, engineered-to-the-job, fills ANY need at a low price, quicker accepted, longer in profit. Furthermore, there is absolutely NO LIMIT to the commercial installations on which you can quote—grocers, delicatessens, butchers, restaurants, florists—all the way to hospitals, institutions and motor trucks where cooling is required. Sell electric or gasoline-powered compressors. Sell a complete line of milk-cooling equipment. Sell air-conditioning products, too—Williams famous Air-O-Matic—with Williams performance and profit.

Yes, the leader leads again! Broader range of products. Wider fields for you as distributor or dealer. And Williams traditional finest materials and workmanship so that your profits stay in your pocket!

Get in back of you this world's greatest concern specializing in the control of temperature. A letter or telegram will bring full details of the Ice-O-Matic distributor or dealer franchise arrangement. Send it today.

Ice-O-Matic Refrigeration Division
WILLIAMS OIL-O-MATIC HEATING CORPORATION
Bloomington, Illinois



The Pevely Dairy Co., St. Louis, keeps milk cool in this special truck, cooled by a gasoline motored Ice-O-Matic.

WILLIAMS OIL-O-MATIC HEATING CORPORATION
Ice-O-Matic Division, Bloomington, Illinois E. R. N. 3-5
Please send me full details of the 1935 Ice-O-Matic line and franchise.

Name.....
Address.....
City.....State.....
Present business.....

WILLIAMS
ICE-O-MATIC
REFRIGERATION

FOR 1935

STEWART-WARNER PRESENTS

Safety-Zone REFRIGERATION

Through an Advanced Principle of Cold Control the Famous Stewart-Warner Slo-Cycle Mechanism Holds Cabinet Temperatures at 42° to 45°—The Safety Zone for Proper Food Preservation.

REAL food preservation performance—practical convenience features—proven mechanical dependability—rugged construction—smart appearance. That's the sort of refrigerator line that builds sales success. That's the sort of line that makes sound dealer profits. And that's what Stewart-Warner offers in three fine groups of refrigerators for 1935.

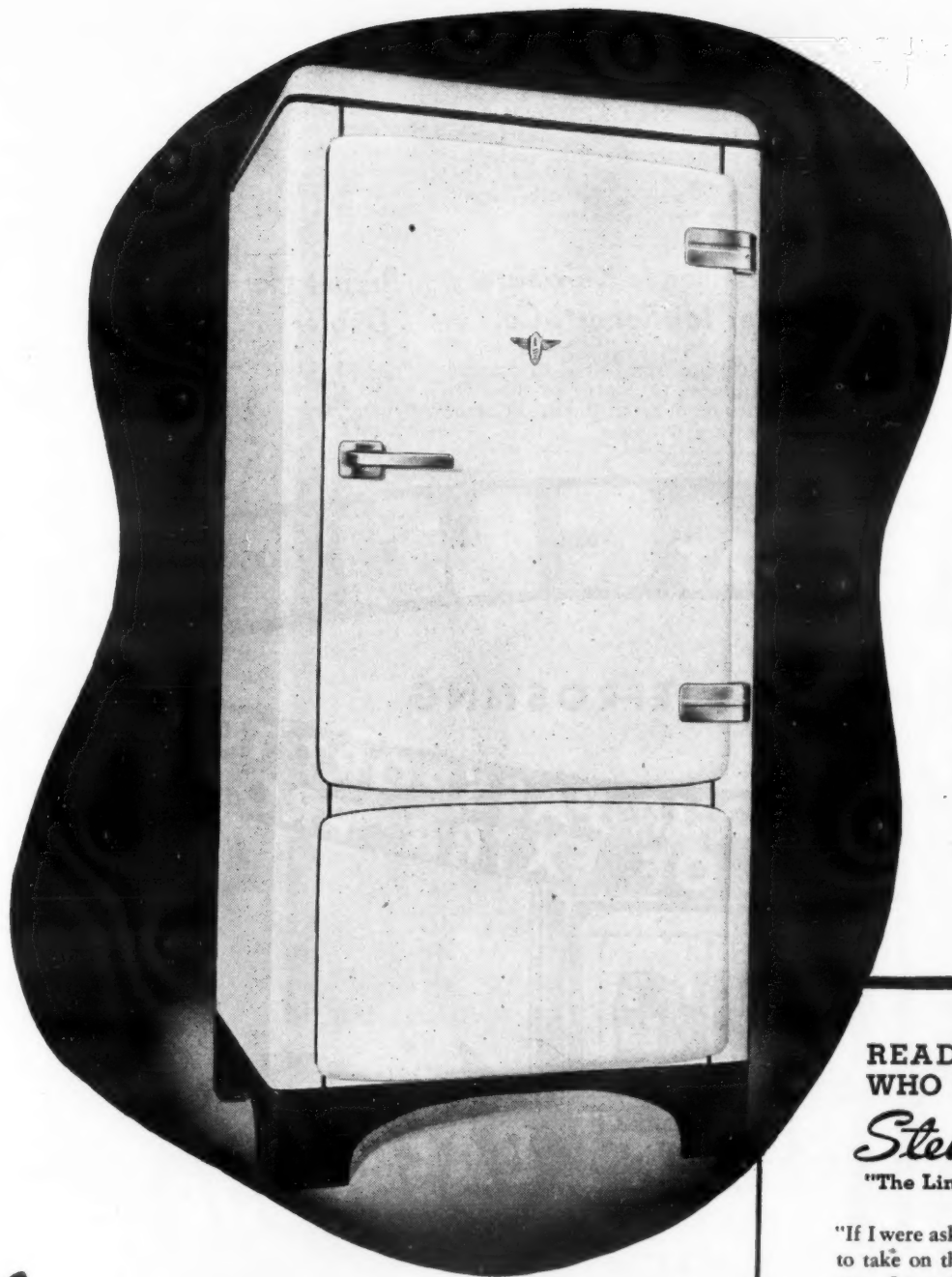
It's a common-sense line from every angle. In Safety-Zone Refrigeration it has the feature that is foremost in every buyer's mind—proper food preservation. In its famous slo-cycle, trouble-free and economical mechanism it has the dependability that has taken "servicing" out of the picture—keeps it "sold" and makes your retail profits NET. Ask any dealer that handles the line.

New Selling Plans for Dealers—New Advertising—New Merchandising Helps

During 1935 the sale of the Stewart-Warner line will be promoted by a hard-hitting advertising campaign—the kind that builds actual traffic for your store. But we're not stopping with that alone. Tested, proven, practical merchandising plans will back the line from start to finish. Nothing has been overlooked to give the dealer something he can "get his teeth into" and "go to town" on a sound profit basis. New, generous plans for dealer selling are now offered by every distributor—dealer plans that are written from your side of the desk—plans that include a discount set-up that is RIGHT.

Make no commitments until you get the facts on Stewart-Warner—"The Line Without A Service Problem." Don't delay. Phone, wire or write your distributor today, or communicate with us direct.

STEWART-WARNER CORPORATION
1841 Diversey Parkway Chicago, Illinois



Left: Model No. 605, capacity 6.0 cu. ft. (net). Shelf area 11.3 sq. ft. (net). Line also includes Model No. 505, capacity 5.0 cu. ft. (net), with shelf area 10.0 sq. ft. (net), and Model No. 455, capacity 4.6 cu. ft. (net), shelf area 9.3 sq. ft. (net).



READ WHAT THE MEN
WHO SELL IT SAY ABOUT
Stewart-Warner
"The Line Without a Service Problem"

"If I were asked who influenced me in my decision to take on the Stewart-Warner line of refrigerators, I would answer truthfully—the host of friends I have all over the country—distributors of competitive makes—who told me unanimously that if I could get the Stewart-Warner franchise to 'grab it,' because the line was the most trouble-free and service-free refrigerator line made."

—ADOLPH ULLMAN, Pres.
Northeastern Radio, Inc.
Boston, Mass., Distributors.

"The Stewart-Warner Refrigerators we have sold have required no service, while some other lines we sold have just about taken all the profit during the free-service period. We get nothing but compliments on the Stewart-Warner."

—W. A. PENDLETON
Shelby, N. C., Dealer.

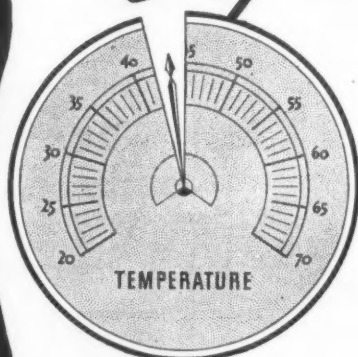
"... we are now 100% Stewart-Warner. We just purchased one solid carload of Stewart-Warner Refrigerators from our distributors, the Moore Electric Company of San Francisco."

—LOUIS C. SCHRODER
Sacramento, Calif., Dealer.

Let the Matchless, Dependable Slo-Cycle STEWART-WARNER Mechanism Help You to Keep Your Profits in 1935. Write Your Distributor Now.

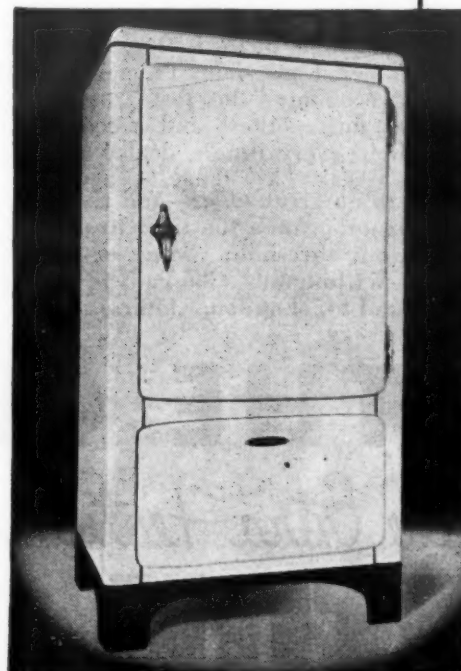
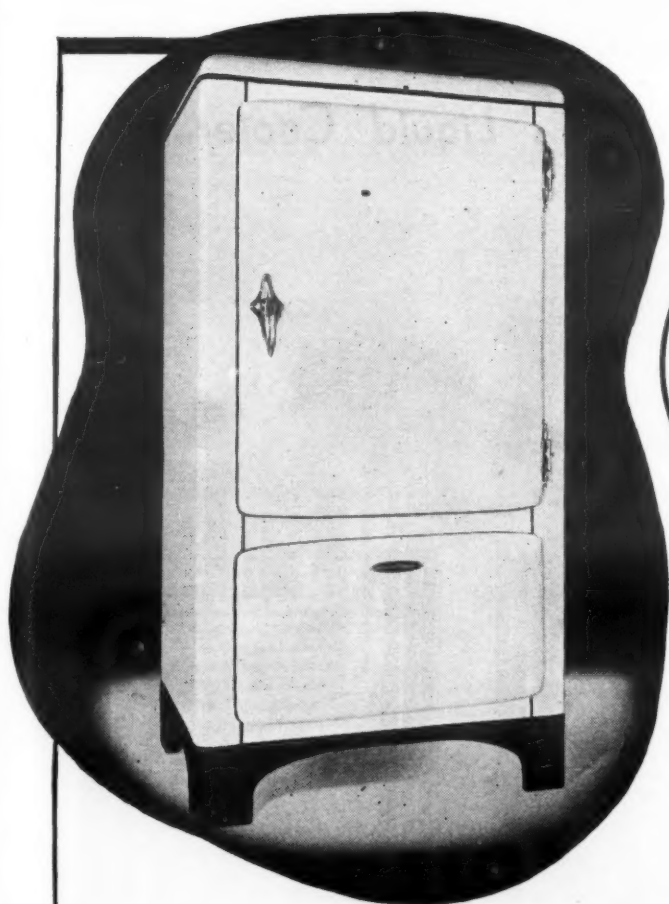
Why SAFETY-ZONE REFRIGERATION?

AUTHORITIES agree that a temperature between 42° and 45° F. is the ideal zone for proper food preservation. This is the zone where foods are kept at their best—at colder temperatures they dehydrate more rapidly with loss of flavor in the drying process—in warmer temperatures there is danger of spoilage. Stewart-Warner accurately maintains this Safety-Zone Temperature—confines fluctuation to these narrow limits. Does it economically.



Left: Model No. 724P, capacity 7.1 cu. ft. (net). Shelf area 13.4 sq. ft. (net). Also Model No. 574, capacity 5.6 cu. ft. (net). Shelf area 10.5 sq. ft. (net).

Right: Model No. 705, capacity 7.1 cu. ft. (net). Shelf area 13.4 sq. ft. (net). Line also includes Model No. 555, capacity 5.6 cu. ft. (net), shelf area 10.5 sq. ft. (net), and Model No. 465, capacity 4.6 cu. ft. (net). Shelf area 9.3 sq. ft. (net).



STEWART-WARNER

New-Type ELECTRIC REFRIGERATOR

G-E Executives and Distributors Swap Sales Ideas at Nela Park



General Electric Institute at Nela Park, Cleveland, has every conceivable modern convenience and comfort to make sessions between distributors and executives pleasant and productive. Hence, any time you drop in there you'll find distributors present for impromptu discussions. (1) Ralph Cameron, assistant sales manager, and (2) Edwina Nolan, home economics director, get the "low-down" on a local situation. (3) An unidentified newcomer tells Turner Barger, Cincinnati distributor, and L. H. Miller of the Cleveland distributorship how to make their territories more productive. (4) Jim Morton (right) of the Ochltree Electric Co., Pittsburgh distributor, listens in, too. These pictures, and similar ones in this issue, were taken by the editor.

Jones Co. Named Crosley Dealer in Fort Worth

FORT WORTH, Tex.—The T. C. Jones Co. here has been named dealer for Crosley electric refrigerators, W. W. Slaughter of the Shield Co., Inc., distributor, reports.

Michaels Brothers Handles Crosleys in Brooklyn

NEW YORK CITY — Michaels Brothers of Brooklyn now handle the Crosley line of electric refrigerators in their seven furniture stores in Brooklyn and Long Island.

Bushwick-McPhilben Shows New Spartons

NEW YORK CITY — Introduction of the new Sparton line of refrigerators was made by the Bushwick-McPhilben Corp., with a complete display of new models at the firm's headquarters here recently.

Sparks Heads Kelvinator Sales for Roberts Co.

LEXINGTON, Ky.—Fred C. Sparks has been placed in charge of the Kelvinator department of the L. L. Roberts Furniture Co. here.

Hombs Heads Watermatic Sales Promotion

WATERLOO, Iowa—Hal Hombs, formerly of the Reuben H. Donnelley Corp., Chicago, has been appointed sales promotion manager for the National Metal Products Co., manufacturer of the National Watermatic washer.

Bryant Hardware Is G-E Dealer in Danville, Ky.

DANVILLE, Ky.—The Bryant Hardware Co. here has been appointed dealer for General Electric appliances.

Larkin's New Cooler Uses Brine & Has Positive Temperature Control

(Concluded from Page 1, Column 1) cube maker in the same refrigerating system.

The Larkin needs no surge tank because it has a holdover of 5 gal. of brine at all times, Mr. Larkin says. This brine takes care of peaks, eliminating surge tanks and oversize refrigerating machine units on all installations.

The cross sectional view of the cooler (above) illustrates its operation. Refrigerating coils cool brine in the compartment on the left. Compressor operation is dependent upon the brine temperature.

Cold brine is forced through a cold brine by-pass to the beer coil compartment on the right, flowing directly on top of and around the beer coils. The warm brine is returned to the refrigerating side of the cooler through a warm brine by-pass.

The cold control starts and stops the brine circulating motor. It is actuated by the thermostatic bulb placed along side of the beer coils. A pre-determined serving temperature within a range of 33° F. to 43° F. can be maintained with a variation of no more than 1° F., Larkin engineers claim, regardless of how cold the brine may become in the refrigerating coils side of the cooler.

A separate water cooling tank on the beer compartment side of the cooler holds a quart of cold water for bar service at all times.

The Larkin Dual-Control liquid cooler is available for from one to five taps. Each tap has an individual beer coil. With a two-tap cooler the user can serve two kinds of beer.

If a two-tap cooler is installed to meet present needs, and, if in the future business demands three or up to five taps, additional beer cooling coils can be added.

The cooler can be used for Freon, methyl chloride, sulphur dioxide, or ammonia refrigerating systems. While it will probably be used most extensively for cooling beer it can also be used for other beverages.

Other features claimed by Mr.

Larkin for his new cooler are: one minute after beer coils are steam or chemically cleaned, 38° F. beer can be served; reserve cold hold, sufficient to cool three gallons of beer 10° F. without starting compressor; beer temperature can be regulated instantly according to weather with no change in compressor adjustment.

'Service Section' Added To 1935 Directory

(Concluded from Page 1, Column 3) the development of the refrigeration and air-conditioning industries up to Jan. 1, 1935.

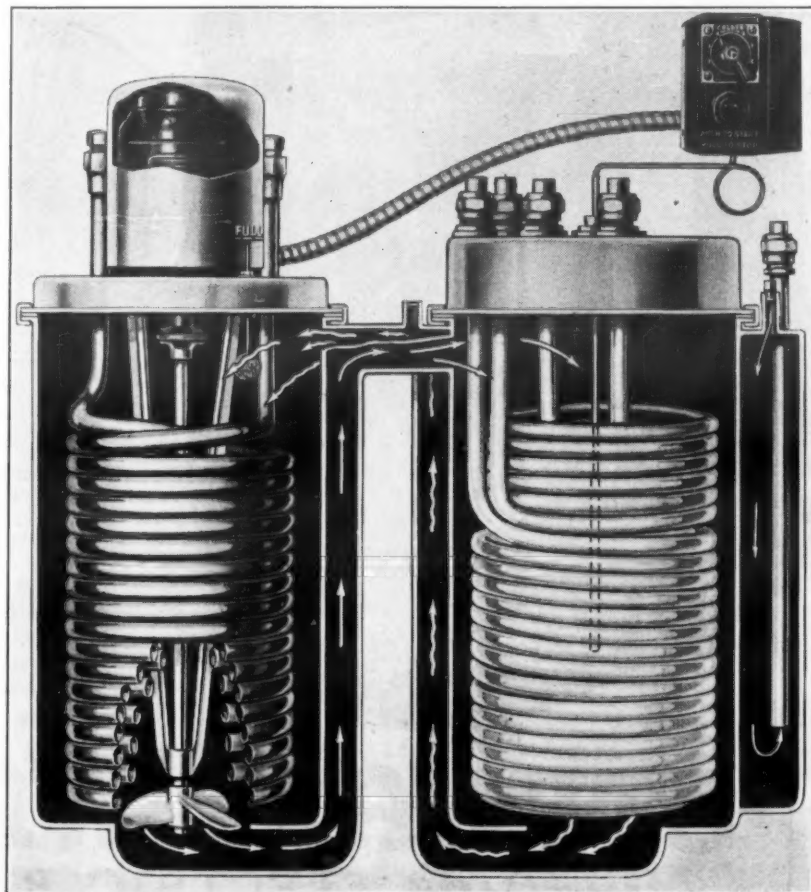
There will be no free distribution of these books. Copies may be obtained only by sending orders direct to Business News Publishing Co., 5229 Cass Ave., Detroit, Mich. The two volumes will be sold together at \$5.00 per set. There is a reduction in price when ordered in combination with a subscription to ELECTRIC REFRIGERATION NEWS, the combined rate of the two books and a one year's subscription being \$6.50 post-paid to all points in the United States and countries in the Pan-American postal union.

The rate for the two books to other countries is \$6.00 and the combination price with a subscription to the News is \$9.00. In the case of books shipped to Canada, it is necessary for the subscriber to pay a special tariff which will be collected by the Canadian post office on delivery. It is estimated that this tariff will amount to \$2.59.

Lansing Co. to Distribute Automatic Washers

SCRANTON, Pa.—D. T. Lansing Co. of this city was recently appointed distributor for Automatic washers and ironers in the state of Pennsylvania, officials of the Automatic Washer Co. report.

Larkin's Liquid Cooler



In the chamber on the left, brine is cooled by the refrigerant coils, and is then forced into the other tank at the right, where it cools the beverage.

SEE THAT CLOCK

IT CONTROLS DEFROSTING

IT'S YOUR PASSPORT TO A LAND OF EXTRA PROFITS

BASKADOR

● Sparton dealers are all excited about the 1935 Sparton refrigerator. *Its got what it takes to make a sale.* Every refrigerator has certain important features—well, Sparton has these, too. But, in addition, Sparton has a number of important EXTRA features. The exclusive Antifrost clock—by completely automatic defrosting makes Sparton the ONLY automatic refrigerator. It saves in electricity—runs much more efficiently—refrigerates better—an amazing development. Then there's the Vegabin—the only compartment for bulky foods in any refrigerator which does not require opening the refrigerator door when the vegetable compartment is opened. The Baskador is another Sparton feature that women want. The Trigger ice tray release—the 20% to 30% greater economy—the fast freezing, quiet unit—the high lustre Spar-lac finish—these and a score of other features are stepping in to help every time a dealer approaches a prospect.

● Here's a great seller—and there's a grand plan behind Sparton. Investigate! Now's the time to prepare for the open season which is on your threshold. Write or wire today for more details. The Sparks-Withington Company, Jackson, Michigan, Sparton of Canada, Ltd., London, Ontario.

VEGABIN

SELL BY THE CLOCK
Women want the Extra Features of the new
SPARTON ELECTRIC REFRIGERATOR

ADS LIKE THESE ARE MAKING REFRIGERATOR HISTORY THEY'LL MAKE SALES FOR YOU!



BUY NO REFRIGERATOR UNTIL YOU

FIND OUT WHAT'S INSIDE THE COILS

★ IT'S *WHAT'S INSIDE*
THE COILS THAT COUNTS
GRUNOW **CARRENE** IS SAFE!



Grunow Alone Uses CARRENE . . . A Liquid, Not a Gas . . . That Ends Every Possibility of Fire, Explosion, Dangerous Fumes . . . See It, Test It Today!

THAT'S exactly what 150,000 careful mothers have done during the past two years, before buying their electric refrigerators. They've FOUND OUT WHAT'S INSIDE THE COILS. And here's why they've chosen the Grunow . . .

Vital Facts That All Should Know

Every electric refrigerator has a chemical refrigerant inside its pipes and coils. But only the Grunow uses CARRENE, a harmless liquid, not a gas. Your dealer invites you to handle it, smell it, even light a match to it! See for yourself why this magic fluid ends even the remotest fear of fire, explosion, dangerous fumes.

Why it has been chosen to safeguard not only 150,000 homes, but the Capitol at Washington and other great public buildings.

Costs Less to Operate, Too

Thanks to CARRENE, you get not only ABSOLUTE SAFETY in the Grunow, but an utterly different kind of cooling mechanism. So simple that it saves you big money on electricity. So trouble-proof that service expense is practically unknown!

Visit your Grunow dealer today. See how this amazing refrigerator excels not only in economy, but in every other comparison . . . With its thrilling new kind of beauty . . . With such wonderful conveniences

as the fast-freeze control, automatic interior lighting, foot-pedal door opener. And most important of all, with COMPLETE PROTECTION FOR YOUR LOVED ONES which you can prove to yourself in three simple tests with Safe CARRENE.

Before you buy an electric refrigerator, demand these proofs of absolute safety—and get them in the Grunow! If you prefer, mail us your name and address on the margin of this page. We will arrange for you to make these sensational tests right in your own home, free of charge or obligation. Simply address Dept. C, General Household Utilities Co., 2650 N. Crawford Avenue, Chicago.

Demand these PROOFS of SAFETY



Grunow

SUPER-SAFE REFRIGERATOR

Product of General Household Utilities Co.

PERSONALITIES

By George F. Taubeneck

Reading the Mail

One of the chief pleasures of this job of ours is reading the mail. Everybody likes to read letters, and few individuals get so varied an assortment of mail as an editor.

There's an "out" to the situation, of course, which is that it takes an unchristian number of hours to answer them all. Some of these letters require research, others a bit of pondering as to the best method of answering. And sometimes they pile up discouragingly fast.

But it's all a lot of fun.

Coming back from a trip we are invariably impatient to get home and see "what's in the mail." And then it's generally a week or so before we can get caught up—between staff conferences, telephone calls, visitors, dining with visiting firemen, and planning for coming issues—on our answers.

This week we've been doing a lot of answering. And last night we were showing some of this correspondence to neophyte TED QUINN, our new editorial staff member, with the notion that it might help him get an idea of what it's all about.

Ted was fascinated.

"Why," he asked, "don't you put some of those letters and answers on your page? They'd make swell reading, and I'll bet your dear public would get a big kick out of seeing samples of the various things that come in."

So here you are, gentlemen. Look over the editor's shoulder and read a small portion of one week's letters:

On Cutting Prices

The Curtis Publishing Company
Independence Square
Philadelphia, Pa.
February 8, 1935.

Editor:

We should like to have any stories that you could send us to assist us in the following problem:

There is a certain manufacturer of high-priced quality products who is thinking of reducing the prices all along the line. To guide him in his decision and also for use in other instances, we should like to know what have been the results either in a specific way or in general with manufacturers in the consumer industries (that is excluding industrial goods such as machinery, building materials, etc.) who have reduced their prices. These examples may fall within any one of the following three classes:

First, those who because of improved machinery, methods or material, have been able to pass savings on to the consumer in the form of lower prices, while the manufacturers still made the same profits. Some automobile companies, tobacco firms and others might fall within this group as well as such cases as that of Celophane perhaps where increased volume came first and then prices were reduced to the consumer.

Second, there would be that class of manufacturers in which the price of the product was originally way out of proportion to the price of competitive products, as in the case of ginger ale, for example, where the high-priced product was repriced and cut to meet this condition.

Third, there would be those cases where prices were cut first in the expectation of increasing volume and therefore of maintaining profits at the previous level. The manufacturer we have in mind would come within this classification, as would also Ethyl gasoline, we believe.

Even if you are unable, or not permitted, to give us the results in certain cases, a statement as to which companies cut prices and why they did so might give us a lead that would be helpful. Any material that you can give us within your own trade field would be very much appreciated indeed.

CHARLES COOLIDGE PARLIN,
Division of Commercial Research
Advertising Department.

Answer: Prices in the electric refrigeration industry have been amazingly uniform through the years of its greatest sales. Frigidaire has generally established the scale, and other manufacturers have followed suit—except General Electric, which has priced its Monitor Top line somewhat higher than competition.

Each year the average retail price has dropped some, partly because the industry's sales curve has gone up steadily, partly because development costs have been written off, and partly because the market has descended into lower and lower income levels.

In only one instance, however, has this orderly price trend been disturbed. Right in the middle of the Depression a number of opportunists saw

a chance to chisel in on the fine public acceptance for electric refrigeration. So they formed "fly-by-night" household electric refrigerator manufacturing companies, sold cheapened "jillolopy" refrigerators directly to department stores, and obtained retail prices of \$99.50 and less.

These opportunists (some of which were fairly substantial manufacturers of other products who were looking for something to keep the wheels turning in their idle factories) so worried the major manufacturers that, under the leadership of Frigidaire, they put "leader" models on the market to meet this competition.

Nobody—manufacturers, distributors, dealers, salesmen—made any money on those models. But the competition was driven out, and now the field has narrowed down to a few comparatively large manufacturers.

This year the base price is \$119.50. Crosley gets under this figure, but that is to be expected; for Crosley has always followed a low-priced policy with all of his products, and makes most of his sales in the "sticks." The rest of the manufacturers price their smallest regular models at or near that figure. General Electric's prices will be more in line with those of the rest of the industry this year.

An example of the futility of price-cutting came last year when David Lillenthal of the Electric Home and Farm Authority bullied manufacturers into putting out the "chest model" refrigerators at a retail price of \$79.50. A large number of these underpriced jobs are still in manufacturers' warehouses.

A specialty selling industry like electric refrigerators doesn't need to depend on price. And its remarkably successful record throughout the Depression should be convincing evidence that price-cutting is not the answer to the problem of obtaining volume distribution.

Jack Schaefer and The Good Ole Days

York Ice Machinery Corp.
York, Pa.

Editor:

Have you seen this new Canadian paper? I discovered it in a magazine file yesterday, and know you'll be interested in getting a copy if you haven't already.

I'll be writing you in more detail about other things later. Behave yourself.

JOHN T. SCHAEFER.

Answer: Hearing from you was swell. And thanks for the information. I would have enjoyed hearing more about you and what you are doing, however. Take a night off sometime and tell me, won't you?

You'll be glad to hear that the Directory went over big. It has 102 pages of advertising, as compared with 76 last year! It's going to be a good book, too. Cutting is handling it in fine shape, with the very capable assistance of Dorothy Ross.

The new building now begins to look like a new building, rather than a hole in the ground. Walls are up three stories high, and you can see that it's going to be very handsome, indeed.

FMC gave me a thrill the other day when he took me over and showed me the bed for the press. When we can walk over and see ERN coming off our own press, that's going to be sumpin'. I get a big boot out of just imagining it.

Remember when all we had was Bill Lamb and a couple of cases of type?

And when we were trying to teach Rose Bell how to do rewrites, and arguing with John Dittler about how to make up a paper? And the Addison and the Majestic, to say nothing of Fort Shelby beds and those dollar breakfasts? Them was the days.

A couple of times I've dropped in on the Bakers, and been served tea and cakes and things. The family really misses you a lot. So, incidentally, do I. By the way, Keith Lewis is leaving town. Has been promoted to a much better job, at really important money, down in Atlanta. The Hilo Quorum is now completely busted.

In some ways, it's been a helluva year. First Mat and El, and then you, and now Keith.

I've bought a pipe, and am looking around for a dog, as I guess I'll have to resign myself to a lonely life. Had a nice cat for a couple of days, but it disappeared.

Fact is, though, that I've been too busy to get very lonesome so far—what with covering the air-conditioning industry (which is just beginning to get good), pinch-hitting on the Directory, training a new staff, and

trying to keep the paper filled with useful information. Now that you've gone, we realize just how much copy you and Herron did turn out.

Is York doing anything newsworthy? I'd like to come down and visit you.

...

Wanted: A First-Class Mrs.

California Refrigerator Co.
1077 Mission St.
San Francisco, Calif.

Editor:

The attached wrapper is from the Jan. 7 *Electric Kitchen Times* sent to us, and from the address it appears that they probably took my name from the 1934 REFRIGERATION DIRECTORY AND MARKET DATA BOOK which you publish. We would just like to pass this information on to you.

Please tell Miss Knight that my good friend and fellow Rotarian (her cousin), George McShea, told me at the Rotary Club yesterday that she had asked about me. I feel quite flattered that I am becoming so well acquainted at the office of such a wide-awake group as the ELECTRIC REFRIGERATION NEWS organization.

I have invited Mr. and Mrs. Taubeneck to visit us in California, and now I extend this invitation to Miss Knight and the rest of the organization. We, in California, cannot understand why anybody wants to live in any other place but California, and especially at San Francisco.

CLARENCE F. (SANDY) PRATT,
President.

Answer: If some good promoter or match maker in the industry can produce an acceptable and willing candidate for the job of Mrs. Taubeneck, the editor might be in position to consider Sandy's kind offer. Miss Betty Knight, the capable editorial secretary, sends her best regards to all good San Francisco Rotarians.

...

History Is Still In the Making

The American Society of
Refrigerating Engineers
37 West 39th St., New York City

Editor:

I had an inquiry from the Association of Edison Illuminating Companies as to who would be the best man to write up the history of electric refrigeration of the last five years and I told them about you.

On Feb. 21 I had a letter from Preston S. Millar saying that he had written to you. At the same time it crossed my mind that if you undertook this mission for him you might be willing to let us have the same material or part of it for appropriate use in *Refrigerating Engineering*.

To be precise, I would like to ask you to be the author of the leading article in our May issue which will be a sort of special convention number devoted to things interesting to Detroit. I have in mind as a title something like "The Last Five Years of Refrigeration" and for material the theme which you have carried out in your survey articles heretofore, embroidered, of course, with plenty of pictures.

Will you let me know whether you can do this? I am sure the members would be very much pleased by such a contribution.

DAVID L. FISKE,
Executive Secretary.

Answer: Yes, Mr. Millar wrote me about the plan of the Association of Edison Illuminating Companies to prepare a history of the electrical industry; and I suggested that he refer to the bound volumes of ELECTRIC REFRIGERATION NEWS—quoting him prices, just in case he didn't happen to have a set—for source material.

The News has faithfully and accurately recorded the week-by-week progress of the electric refrigeration industry, and in these bound volumes a historian should be able to find all the information he should need.

Perhaps I'm not being a good A.S.R.E. member, but I don't quite feel up to the task of writing a history of the industry for the last five years for publication in *Refrigerating Engineering*.

With all due modesty, I'll readily admit that perhaps nobody is better qualified to write such a history, for during that time I've been on the spot (or rather, "spots") where and when important news was being made, have known intimately the men who were pulling the strings behind—as well as in front of—the scenes, and have written thousands of words every week on the progress of the industry.

But the deuce of it is that things are still happening. I'm too busy keeping up with current events to revisit the scenes of the past. I fully intend to write a history of the industry some day—a wowser, too, by golly—but right now I have my hands full being a reporter.

When the pace slows down a bit perhaps we can begin work on that monumental tome.

The local A.S.R.E. chapter is still as interesting as ever, and embraces as fine and talented a set of engineers

as you will find anywhere. By the way, the chapter has a bone to pick with you.

At the last meeting it was voted unanimously to insist that you include the name of George Bright as a past president of the society on the masthead of the society publication, along with the other past presidents.

As you know, George is not only a past president, but practically the godfather of the society. Moreover, he is one of the most universally respected and versatile refrigeration engineers in the country today, and we should be proud to display his name.

...

'Latest Paris Creations'

New York Store
Latest Paris Creations
171 Main St., Marlboro, Mass.

Editor:

Kindly advise what you have to improve sales on Grunow refrigeration, including last year record and comparison with others.

J. WARSOFSKY.

Answer: Everything we know which might "improve sales of refrigeration" is printed in the weekly issues of ELECTRIC REFRIGERATION NEWS.

If you want something to "improve sales" of Grunow refrigerators only, we suggest you contact Messrs. H. C. Bonfig, Duane Wanamaker, and Jim Davin of General Household Utilities Co., Chicago.

Improving Grunow sales is their job. Reporting impartially the news of the entire refrigeration industry is ours.

All the known and available figures on the electric refrigeration business in 1934 will be published in the 1935 MARKET DATA BOOK, on which we are now working, and which should be out within a month.

Statistics on 1934 refrigeration sales were published in the Feb. 20 issue of ELECTRIC REFRIGERATION NEWS. Figures on sales of individual companies have never been made public.

We are trying very hard to obtain and print information which will help salesmen "improve sales," and we feel confident that a steady and painstaking perusal of ELECTRIC REFRIGERATION NEWS will supply you with more than enough ideas to keep your refrigeration business humming.

Bob Tull's Cooler For Coca-Cola

Northern Electric Co., Ltd.
1261 Shearer St.
Montreal, Que., Canada

Editor:

Can you obtain for me a copy of the News for Oct. 17, 1934? This particular issue contained a story on a Coca-Cola cooler developed by Westinghouse in which we are very much interested.

M. MOUSETTE,
Merchandising Sales Dept.

Answer: We are glad to fill your order for a copy of the Oct. 17 issue of ELECTRIC REFRIGERATION NEWS.

That Westinghouse Coca Cola cooler in which you are interested was developed by an old friend and fraternity brother of mine, Bob Tull, and I'm almost as proud of it as he is. He was one of the best engineers the University of Illinois ever turned out, and I have a good hunch that the product must be right.

What's the news up in Quebec? We'd appreciate receiving a long letter about the Canadian refrigeration situation today.

...

Refrigeration Week And the Bureau

Western Union

Editor:

Do you know of a national refrigeration week which is to be held by local utility companies of various cities? If so when will this be held?

General Household Utilities Co.

Answer: Electric Refrigeration Week was an activity sponsored by the Electric Refrigeration Bureau of the Edison Electric Institute. Under the direction of this organization elaborate shows were held simultaneously—generally the first week in October—in a great many cities in the United States. With the public utility in each city promoting the affair actively, dealers and distributors cooperated, huge joint exhibitions were staged, newspaper advertising was stepped up, contests were held, and many stunts were "pulled"—all calculated to focus public attention on the merits of electric refrigeration.

Last year, however, the Electric Refrigeration Bureau died quietly. Leading manufacturers of electric refrigerators had been contributing the money for its support; and when support was cut off, the Edison Electric Institute refused to prolong the life of the bureau by reaching into its own sock for budget wherewithal. So the bureau is no more.

I have an idea that an "electric refrigeration week" will probably be held in a number of cities this year which have previously found the activity highly successful. But as yet

no dates have been set, nor is there any likelihood that any such activity will be coordinated. In other words, if such "weeks"—if any occur—will be entirely local affairs, and are likely to come any time.

We'll find out about them as soon as anyone, so watch the columns of ELECTRIC REFRIGERATION NEWS for further information.

...

Don't Let Us

Discourage You, But—

Westinghouse
Electric International Co.
30 Rockefeller Plaza, New York City

Editor:

The excellence of your "Candid Camera" illustrations in the ELECTRIC REFRIGERATION NEWS has prompted us to write to you and to ask you how you do it. Especially we would appreciate your letting us know the type of camera you use and what equipment you use in the way of auxiliary lights.

PAUL L. SCOTT,
Advertising Department.

Answer: Your "how-do-you-do-it?" question regarding the candid camera photographs in ELECTRIC REFRIGERATION NEWS has been put to me so many times in the last year that the answer has become almost automatic. By this time, however, I've begun to get a little skeptical about the wisdom of giving the answer.

Why? Because a good many of my friends have invested quite a pile of money in miniature cameras without getting any pleasing results. These outfits cost from \$300 to \$1,500 and up; but merely having the camera and the lenses does not assure you of getting good pictures.

After seeing our pictures in ELECTRIC REFRIGERATION NEWS, a large trade publishing company put several hundred dollars into a Leica outfit for the editorial staff of one of its papers about a year ago. The editor told me a few weeks ago that they have been quite disappointed with the results so far, having obtained only about a dozen useable pictures. Likewise, another publication bought a Contax outfit and had disappointing results.

Vincent Lopez maintains that he has never taken a good photograph with the Contax he bought a year ago after seeing some of my shots, and Hal Kemp is also sore at me for the same reason.

Nor were my pictures worth looking at for a couple of years. As far back as 1932 F. M. Cockrell envisioned the possibilities of the miniature camera equipped with a fast lens, and bought me a Vollaenda. The results were pretty terrible. Later, when the Vollaenda was stolen, he purchased a National Graflex (miniature model with f3.5 lens). By using a photo-floodlight in a reflector, we obtained some useable pictures with this camera.

But I couldn't always carry a floodlight around with me, so I finally broke down and bought a Zeiss Contax with an f2.8 lens.

Even this was too slow. So I obtained an f1.5 lens and a 135 mm. telephoto lens. And then, after burning up yards of film and concentrating intently on the subject, the pictures began to turn out as you now see them.

Miniature camera technique is something nobody can teach you, partly because few people really know much about it, and partly because it is a science which borders on art. Knowing how to take the pictures is only half of it; knowing what to take and when is fully as important.

If you are going into it—and don't say I didn't warn you—buy the best miniature camera you can get, either a Leica or a Contax. Get the fastest lens available (Contax—f1.5; Leica—f1.9) so that you won't need to use auxiliary lighting.

Then patiently set out educating yourself by the trial-and-error method.

The chief thing to learn is how to judge light intensity quickly. You can use a photoelectric cell to help you outdoors, but inside snapshots, unless you have a lot of time to fiddle around, must be snap judgment pictures.

The big point to candid camera photos is their unposed naturalness. You can't obtain that with a camera which requires the assistance of a flashlight or floodlight—at least you can't obtain more than one or two at a time. After the first couple of flashes, people begin to get on their guard, and assume (unconsciously, perhaps) their Expression for a Photographer.

Either the Contax or the Leica is so small and unobtrusive that with it you can obtain dozens of pictures in any kind of light without being noticed.

Which to buy? That depends on your individual taste. President George Mason of Kelvinator and President Howard Blood of Norge, both of whom get remarkable pictures, are ardent Leica devotees. Salesmanager John Wyllie of Temprite agrees with my choice of the Contax. Whichever you buy, you'll be in good company.

New York Dealers See Norge Selling Movie

BROOKLYN — A. D. McCaughna, general manager of Norge Corp. of New York, discussed 1935 sales plans at a dealer meeting held recently at the Hotel Granada here. Two reels of the sound picture, "Norging Ahead Together," were presented by S. I. Baggett, sales promotion manager.

E. L. Frolich, Norge New York sales manager, was chairman of the meeting. Speakers included Louis Le Winter, president, and Louis Roth, vice president of the Le Winter's Radio Stores, Inc.

800 Sidles-Duda-Meyers Dealers Attend Two Meetings

OMAHA — Sidles-Duda-Meyers Co., Grunow distributor, held two dealer meetings recently—one in Omaha at the Paxton hotel, and the other at the Savery hotel in Des Moines. W. C. Grunow, president of General Household Utilities Co., was present at both meetings.

Dealers at the Omaha meeting numbered about 600, while the Des Moines attendance amounted to around 200.

Kirkland Will Assist Donald of Nema

NEW YORK CITY — Harry B. Kirkland has been appointed assistant managing director of the National Electrical Manufacturers Association, reports W. J. Donald, managing director of the organization. Mr. Kirkland was formerly director of Nema's Uniform Legislation department.

Other changes in the Nema staff include the appointments of R. Bourke Corcoran to director of the Uniform Legislation department and Wentworth F. Gantt to director of the General Service department.

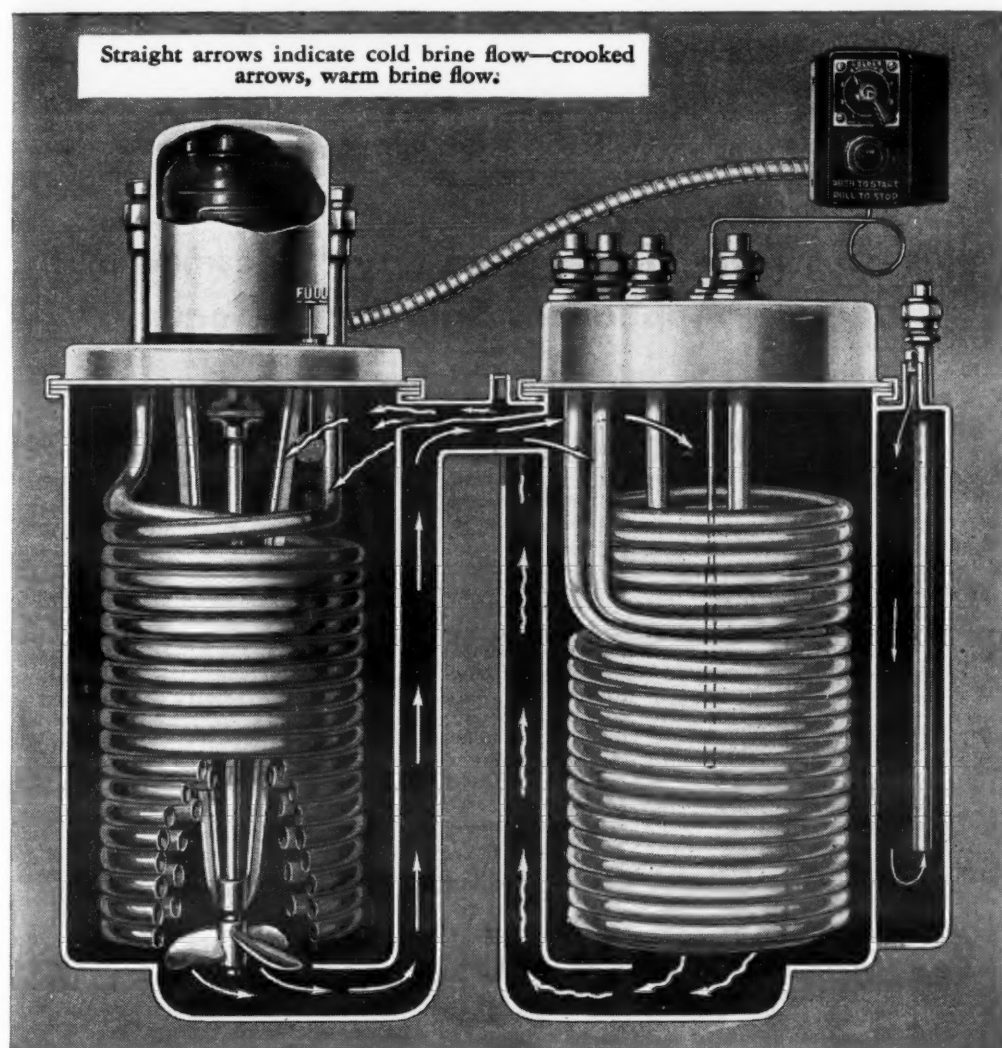
Phillips Has Exhibit of Ice-O-Matic Line at Florida Fair

TAMPA, Fla.—I. W. Phillips Co., distributor here for Williams Ice-O-Matic equipment, had a display booth at the Florida Fair here recently.

The company installed refrigeration equipment for the Pinellas County Exhibit at the Dairymen's Cooperative Association and for the Poinsetta Dairy Co.'s exhibit of two life-sized cows, sculptured from butter. Cooling equipment for the Florida World's Fair Exhibit was installed by Phillips.

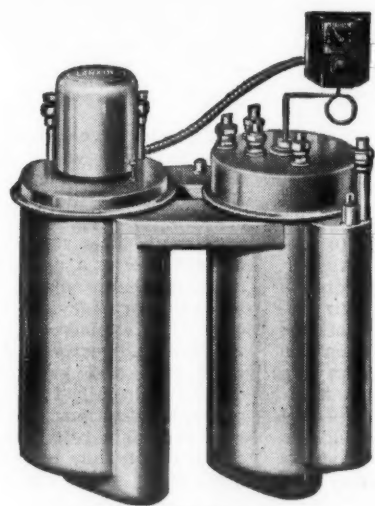
Shapiro to Hold Dealer Meeting March 7

NEWBURGH, N. Y. — Shapiro Sporting Goods Co., Grunow distributor for central New York state and the Hudson valley, will show its dealers the 1935 Grunow line at a dinner meeting March 7 in the Palatine Hotel here. Grunow factory representatives scheduled to be present include H. C. Bonfig, vice president in charge of sales, J. J. Davin, sales promotion and franchise department manager, Dr. J. D. Jordan, laboratory director, and F. H. Schnell, short wave radio engineer.




Announcing the

**DUAL-CONTROL
LIQUID
COOLER**



PATENTS PENDING

OUTSTANDING FEATURES

1. Dual-Control. Brine temperature controls compressor and beer temperature controls brine circulation.
2. One minute after beer coils are steam or chemically cleaned, 38° beer can be served.
3. Reserve Cold-Hold, sufficient to cool 3 gallons of beer 10° without starting compressor. Frequent starting and stopping of compressor is avoided, reducing power costs.
4. Two temperature valves are not used on multiple installations.
5. Any cooler can be enlarged up to five beers by adding additional beer coils.
6. Cold Control. Beer temperatures can be regulated instantly according to weather. No change in compressor adjustment.
7. The only beer cooler that does not disturb and thus preserves the brewed-in flavor.

A Low Pressure System that will Cool Beer to any Desired Temperature, with a Variation of only 1° and with a Capacity to Meet Every Load Demand

● The Larkin Dual-Control Liquid Cooler is easier to sell because it has more exclusive features—more dollar-value. It stands in a class by itself. It's simple in construction—fool-proof in operation. It can be used in multiple installations without two temperature valves, even with an ice cube maker in the same refrigerating system.

The Larkin needs no surge tank because it has a hold-over of 5 gallons of brine at all times. This brine takes care of peaks, eliminating surge tanks and oversize refrigerating machine units on all installations.

The cross sectional view clearly illustrates its operation. Refrigerating coils cool brine in the compartment on the left. Compressor operation is dependent upon the brine temperature. Cold brine is forced through a cold brine by-pass to the beer coil compartment on the right, flowing directly on top of and around the beer coils. The warm brine is returned to the refrigerating side of the cooler through a warm brine by-pass. The Cold-Control, an exclusive feature, starts and stops the brine circulating motor. It is actuated by the thermostatic bulb placed along side of the beer coils. A pre-

determined serving temperature within a range of 33° to 43° can be maintained with a variation of only 1°, regardless of how cold the brine may become in the refrigerating coil side of the cooler. To accomplish these results it is not necessary to readjust the refrigerating unit every time the weather changes. A separate water cooling tank on the beer compartment side of the cooler holds a quart of cold water for bar service at all times.

The Larkin Dual-Control Liquid Cooler is available for from one to five taps. Each tap has an individual beer coil. With a two-tap cooler your customer can serve two different kinds of beer. If you should sell a two-tap cooler to meet the customer's present needs, and, if in the future his business demanded three or up to five taps, additional beer cooling coils can be added. The expense is insignificant and the original investment is protected. Furthermore, your customer can use his present air pump or carbonic gas pressure system.

The Larkin can be used for Freon, Methyl Chloride, Sulphur Dioxide or Ammonia. (Ammonia refrigerating coils are furnished for ammonia.) Write for prices.

For cooling beer, water, root beer, carbonated water, orange juice, milk, etc. For Saloons, Taverns, Hotels, Restaurants and Factories.

LARKIN REFRIGERATING CORPORATION
 102 Fifth Ave. ATLANTA 325 So. California Ave.
 NEW YORK, N. Y. CHICAGO, ILL.



FREE FOLDER

It describes the Larkin Dual-Control Liquid Cooler in complete detail. You'll want it because it points the way for increased sales and profits.

Cold Control—Foam Control

T. K. Quinn Attends G-E Air-Conditioning School at Schenectady



T. K. Quinn, vice president of the General Electric Co., left his New York office recently to address students at the G-E air-conditioning school in Schenectady, N. Y. (1) He studies over his notes. (2) "Well, we look for a big year." (3) Nice soup you serve, Mr. Donovan." (4) "Eh?" (5) He takes part in the after banquet merriment with the air-conditioning school students. At his left is Joe Donovan, manager of the G-E air-conditioning department.

Davis Opens Grunow Store In Little Rock

LITTLE ROCK, Ark.—W. B. Davis Electric Supply Co. recently opened its Grunow radio and refrigerator store and showroom here.

The Davis company has been in business in Arkansas for the past 15 years, the original store being in Memphis, Tenn. The store here will be under the personal supervision of W. B. Davis, president of the company.

Ray Glosier is district sales manager, Ira Whitfield is office manager, and John Vail has charge of the Fort Smith territory.

8,000 Ranges Rented In Indianapolis

INDIANAPOLIS, Ind.—Indianapolis Power & Light Co., local utility, has placed more than 8,000 electric ranges on its power lines during the last six months, officials of the company assert.

Much of the credit for this success is given to the company's six month's rental plan, costing the customer \$1.65 per month, with the option of retaining the range at the end of that period, and as long as five years to pay the balance.

Range rate in Indianapolis is 2½ cents per kwh.

Dealer Uses Own Electric Kitchen for Schools

PIQUA, Ohio—After installing a complete electric kitchen in his own home, Homer V. Monroe, head of the Monroe Supply Co., General Electric dealer here, publicized it in the local papers and then invited prospects for ranges and refrigerators to his own kitchen for cooking schools.

Jeannette Dunnick, home economist for Bard & Barger, Inc., Columbus, conducted the schools, and attendance was limited to 10 women a day.

Monroe Supply Co.'s 1934 sales were more than 600 refrigerators, in a community of 16,000 population.

Terre Haute Store Pays Salesmen of Appliances Salary Plus Bonus

By John O'Malley, Electrical Equipment Buyer
Root Department Store, Terre Haute, Ind.

OUR sales organization for electrical refrigeration comprises seven salesmen and one supervisor, and each of these men is trained to sell in the store and to prospects in their homes.

These salesmen work on the floor about half time, and the other half they are out calling on prospects.

This plan enables us to employ all salesmen on a salary basis, with special bonuses to salesmen who lead in volume each month. Extra commissions are paid to salesmen for sales made outside of the store. The bonus and commission feature is an incentive for salesmen to do their best work when they are outside the store and not subject to personal supervision.

Develop Leads for Salesmen

One reason why we are able to retain the best type of salesman is that we develop an adequate number of live leads for them and make it necessary for them to do much cold canvassing, a phase of selling that is discouraging to most men.

A file of prospects is kept for each salesman, and a sale to any of these prospects is rewarded with a commission. To keep a card active in his file, the salesman must call on the prospect at least every two weeks. When names are removed from these files, other names are inserted so that salesmen always have enough calls to make to keep them busy when they are not working on the floor.

Users Furnish Prospects

Various methods are used to develop leads for the salesmen. An unfailing source of new prospects is the customer who is using our refrigerator. Salesmen are sometimes sent out with instructions to service and inspect refrigerators, carrying a small kit for this purpose. After the refrigerator has been inspected and oiled, the salesman will ask the user for the names of friends or acquaintances who are interested in purchasing a new refrigerator.

Direct-mail advertising also brings in a large number of leads. With each monthly bill sent out by the store there is enclosed a small folder inviting the recipient to come to the electrical department and file her reasons why she likes our line of refrigerators. All women who respond are offered a souvenir in the form of a clover-leaf serving tray. The folders used for this purpose are furnished by the manufacturer with the store imprint for a dollar per thousand. The serving trays cost 3½ cents each. More than 500 prospects were developed within 30 days by this method.

Distribute Booklets

Distribution of booklets is another plan that brings prospects to the department. In our newspaper advertising we offer to give a booklet free to every adult visiting our refrigerator display. The booklets cost us three cents each, and this offer has brought many people to the department.

Another novelty piece that has been used with good results is a celluloid shopping memorandum which can be used in the kitchen to list food items to be purchased. When the salesmen work outside the store they carry a supply of these, the display of which is often an effective door opener.

Save on Carload Orders

We purchase refrigerators in carload lots direct from the factory, thus obtaining the wholesale price and at the same time saving on freight charges at the rate of 35 cents per 100 pounds.

When we display refrigerators in the windows we use all the windows at the front of the store. At the present time we are displaying 27 differ-

ent sizes of refrigerators in these six windows, and along the front of the store we have an electric sign.

We do not demonstrate refrigerators in homes. Such demonstrations are not necessary and we have never thought it necessary to increase our expenses with home demonstrations. We guarantee our customers that every machine is new, that it will keep food cold and operate satisfactorily. If a refrigerator does not do these things, it should be returned to the factory.

Meter Plan Popular

A large number of units are being sold on the meter plan, with payments ranging from 15 to 25 cents per day, and on this plan customers have as long as 30 months to complete payments. Of course, other plans of payment are arranged to meet the wishes of our customers. We charge six per cent interest on unpaid balances, and we finance all our own accounts.

Because refrigerators are placed in homes without down payments on the meter plan, customers under this plan are carefully investigated through the local credit bureaus. We obtain a written report on each customer for which we pay 75 cents.

Year's Service Free

We give free service on refrigerators for one year. Our service department has on hand all the parts that are most likely to be needed for repairs or replacement during the first year. This service department is maintained as a necessary part of our merchandising plan, and while the income for service work does not cover the expense of the department, it does indirectly help us to create good will and greater sales volume because all calls for service are given prompt attention. Customers will not recommend a refrigerator if the store from which they purchased it is negligent in its service work.

Rose Made President Of Bassick Co.

CHICAGO—Election of William A. Rose to the presidency of the Bassick Co. of Bridgeport, Conn., marks a change in the administrative policies of the Stewart-Warner Corp. towards coordinating activities of its wholly-owned subsidiaries, officials of the Stewart-Warner Corp. state. Previously, the president of Stewart-Warner has been president of subsidiaries also.

Mr. Rose was formerly vice president and general manager of the Bassick Co., an organization in the furniture, industrial, and automobile hardware field. Mr. Rose will also be added to the board of directors of the Bassick company at the next directors meeting.

January Refrigerator Taxes Are Higher

WASHINGTON, D. C.—Manufacturers of mechanical refrigerators paid excise taxes in January totaling \$162,534, as compared with \$145,541 paid in the same month a year ago, according to reports from the Bureau of Internal Revenue.

Pico Made Distributor Of Ice-O-Matic Line

BLOOMINGTON, Ill.—The John Pico Dairy Supplies Co. of New Orleans has been appointed a distributor for Williams Ice-O-Matic commercial, milk cooling, and truck refrigeration equipment.

The Sun Never Sets on
EXTRA DRY ESOTOO

Speedy deliveries from 49 convenient distributing points

IN UNITED STATES
Atlanta, Ga., W. P. Russell, Box 778, Security Warehouse Co.
Baltimore, Md., Davidson Transfer & Storage Co.; also Glenden Bros., Inc.
Billings, Mont., Midland Implement Co.
Buffalo, N. Y., Rolls Chemical Co.
Charlotte, N. C., D. & J. Supply Co.
Chicago, Ill., Innis, Speiden & Co.
Cincinnati, O., Williams & Co., Inc.
Cleveland, O., Innis, Speiden & Co.
Dallas, Texas, Dallas Transfer & Terminal Warehouse Co.
Denver, Colo., Auto Equipment Co.
Detroit, Mich., W. C. Dever; Central Detroit Warehouse Co.; Eaton-Clark Co.
El Paso, Texas, H. J. Baron Co.; El Paso Fireproof Storage Co.
Fort Wayne, Ind., Lehman & Schroeder.
Houston, Texas, W. B. Arbuckle; Universal Terminal Warehouse Co.
Indianapolis, Ind., F. H. Langenkamp Co.
Jacksonville, Fla., Mead Warehouse & Dist. Co.
Kansas City, Mo., G. S. Robins & Co.
Los Angeles, Cal., Van D. Clothier.
Louisville, Ky., Harbison & Gathright, Inc.
Miami, Fla., The Warehouse & Transfer Co.; also Electrical Equipment Co.
Milwaukee, Wis., Globe Refrigerator Co.
New Orleans, La., Bartlett Chemicals, Inc.
Oklahoma City, Okla., G. S. Robins & Co.
Peoria, Illinois, Isaac Walker Hardware.
Philadelphia, Pa., Merchants Warehouse Co.; also M. & E. Refrigeration Accessories Co.
Pittsburgh, Pa., Kirby Transfer & Storage Co.; also Wm. M. Orr Co.
Portland, Me., Galt Block Warehouse Co.
Portland, Ore., Carl F. Miller & Co.
Roanoke, Va., Thurman & Boone Co.
Rochester, N. Y., Rolls Chemical Co., c/o Upton Cold Storage Co.
Rockford, Ill., C. B. Pringley.
San Francisco, Cal., Refrigerating & Power Specialties Co.
Salt Lake City, Utah, Denver Fire Clay Co.
Seattle, Wash., Carl F. Miller & Co.
Spokane, Wash., Carl F. Miller & Co.
Springfield, Mass., Boston & Springfield Dispatch Co.
St. Louis, Mo., G. S. Robins & Co.
St. Paul, Minn., Midwest Chemical Co.
Syracuse, N. Y., Rolls Chemical Co., c/o Great Northern Warehouse.
Tampa, Fla., Lee Terminal & Warehouse Corp.; Thuro Radio Distributors.
Toledo, Ohio, Heat & Power Engineering Co.

IN CANADA
Montreal, Quebec, Canada, Bruce Ross, Limited, c/o Pigment & Chemical Co., Ltd.
Toronto, Ont., Canada, Bruce, Ross, Ltd.
Vancouver, B. C., Canada, Shanahan Chemicals, Ltd.
Winnipeg, Man., Canada, Beaver Soap & Chemicals, Ltd.

IN CUBA
Havana, Cuba, Independent Electric Co.

IN ENGLAND
Stock at Honeywell & Stein, Ltd., London House, 3 New London St., London, E.C.3.

IN HAWAII
Honolulu, Hawaii, Weldsteel Supply Co.

IN AUSTRALIA
Sydney, Australia, Dangar, Gedy & Co., Ltd.

VIRGINIA SMELTING COMPANY

West Norfolk, Virginia

F. A. Eustis, Secretary,
131 State St., Boston and
76 Beaver St., New York

EXTRA DRY ESOTOO is recognized, the world over, as a highly-reliable refrigerant—as free from moisture and impurities as human skill can make it—every step in production under rigid chemical control. Refrigerator manufacturers and service men who standardize on EXTRA DRY ESOTOO and its companion-product, V-METH-L, enhance their prestige and increase their profits.

G-E Urges Sales of Lifttops to Raise Minimum Bills

(Concluded from Page 1, Column 1)

ing Administration and the opportunity the FHA program offered to utilities for load-building.

The great majority of new houses to be constructed under FHA regulations, he said, will probably be practical electrical homes. He pointed out the importance of cooperation between the building and electrical industries in promoting the use of appliances.

General Electric's "Home Electric" architectural competition, begun in January in cooperation with the FHA, and in which some 8,000 architects from all parts of the country are now entered, is a move for further union between the building and electrical trades, he said.

First day of the three-day meeting was devoted largely to a presentation of G-E's "Better Light—Better Sight" program, interspersed with talks by O. M. Jackson, merchandise manager for the Georgia Power Co., a leading merchandiser of electrical appliances in the southern states, and T. Millott of the commercial division of the G-E specialty appliances sales department.

New Products Presented

The new 1935 line of G-E refrigerators was presented to executives by Sales Manager A. M. Sweeney. W. M. Timmerman of the engineering division and H. H. Bosworth, manager of the central station division of the specialty appliance sales department, described the features of the new models.

A. L. Scaife, advertising and sales promotion manager, outlined G-E's 1935 sales promotion program and presented new advertising material, available for use by retail outlets.

J. R. Poteat, manager of the range division, presented the new line of ranges; C. J. Enderle of the dishwasher division, the new dishwashers.

M. D. Grow of the advertising and sales promotion division discussed the importance and value of proper training of salesmen, and explained the G-E sales training program. Jean De Jen, campaign division manager, spoke on G-E campaigns and sales services available for use by utilities.

The third day of the conference was a closed session, devoted exclusively to the utility's operating problems.

Convention Attendance

Associated Gas & Electric Co. executives who attended the convention included:

G. W. Allison, Edison Electric Institute, New York City; A. J. Althouse, Metropolitan Edison Co., Reading, Pa.; H. V. Armstrong, Electric & Gas Utilities, Terre Haute, Ind.; H. B. Atkin, Utility Management Corp., New York City; C. S. Banghart, New York State Gas & Electric Corp., Binghamton, N. Y.; F. D. Campbell, Staten Island Edison Corp., Staten Island, N. Y.; Miles Cary, Florida Public Service Co., Orlando, Fla.; N. H. Coit, Broad River Power Co., Columbia, S. C.

W. A. Davies, Utility Management Corp., New York City; W. H. Doran, New York State Gas & Electric Corp., Lancaster, N. Y.; B. M. Fast, Utility Management Corp., New York City; J. R. Geib, Kentucky-Tennessee Light & Power Co., Bowling Green, Ky.; W. B. Goudey, New York State Gas & Electric Corp., Binghamton, N. Y.; James Gorton, Daniel Starch & Staff, New York City; I. F. Haddock, New England Gas & Electric Assn., Cambridge, Mass.; J. P. Haftenkamp, Rochester Gas & Electric Corp., Rochester, N. Y.; P. H. Harris, Pennsylvania Electric Co., Johnstown, Pa.; E. E. Hawkins, Jr., Patchogue Electric Light Co., Patchogue, N. Y.; H. M. Henry, Utility Management Corp., New York City; F. H. Hill, Elmira Light Heat & Power Co., Elmira, N. Y.

O. M. Jackson, Georgia Power Co., Atlanta; R. D. Jennison, Utility Management Corp., New York City; I. Lundgaard, Rochester Gas & Electric Corp., Rochester, N. Y.; L. H. McCray, Erie Light Co., Erie, Pa.; K. A. McIntyre, Daniel Starch & Staff, New York City; S. J. Magee, Associated Gas & Electric Co., New York City; J. A. Podmore, Daniel Starch & Staff, New York City.

J. R. Ramsey, New York State Electric & Gas Corp., Mechanicville, N. Y.; W. G. Rhodes, New York State Electric & Gas Corp., Mechanicville, N. Y.; T. F. Rowe, Associated Gas & Electric Co., Ithaca, N. Y.; J. F. Sharkey, Rochester Gas & Electric Corp., Rochester, N. Y.; O. Titus, New York State Gas & Electric Corp., Lancaster, N. Y.; A. R. Tremaine, Utility Management Corp., New York City; A. E. Ward, Utility Management Corp., New York City; O. E. Wasser, Associated Gas & Electric Co., Ithaca, N. Y.; Leslie Weiss, Utility Management Corp., New York City; F. Wentworth, Rock Gas & Electric Co., Rochester, N. Y.; E. H. Werner, Metropolitan Edison Co. & N. J. P. & L. Co., Reading, Pa.; L. D. West, Utility Management Corp., New York City.



NO BLANK PAGES IN THE NORGE DEALER CALENDAR

• Norge dealer co-operation, Norge advertising, Norge progress are never-ending. Like the waves on a stormbeaten coast, one surge follows another, and Norge dealers are constantly backed up with aggressive seasonal sales support.

The mechanical superiority of Rollator Refrigeration has national consumer recognition. Norge has long led the field in the modern beauty of its design, in convenient appointments. Norge originates. And the customer who has "shopped around" always sees *Plus Values* in the Norge.

Norge advertising is always planned to stop the reader and make him think; window displays pay the rent; sales plans inspire enthusiasm of salesmen to profitable effort.

With Norge there is no dull season—a sales plan for every month. And as evidence that they work, witness the Norge march of progress throughout the years... its steady rise to prominence in the refrigeration field.

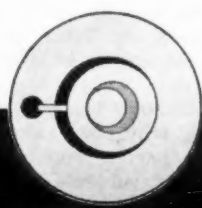
As further assurance of year-round profits for the dealer, Norge now offers a washer, an oil burner, an electric range, a gas range, a Broilator and an Aerolator air conditioner.

Write, wire or phone for details of the Norge program and line of products.

NORGE CORPORATION

Division of Borg-Warner Corp., 606-670
East Woodbridge St., Detroit, Michigan

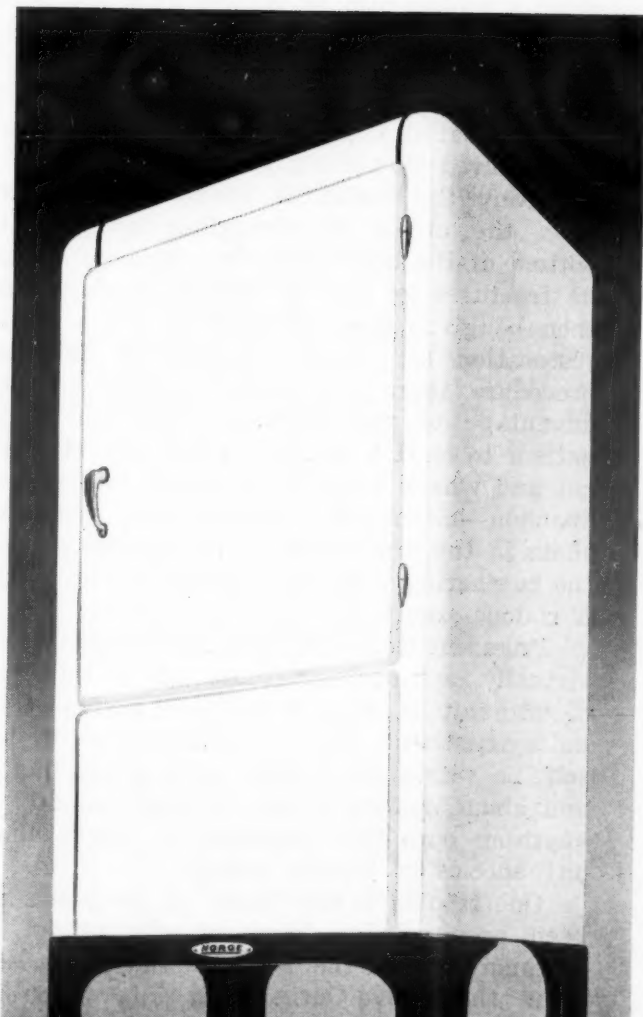
NORGE ROLLATOR REFRIGERATION •
NORGE ELECTRIC WASHERS • BROILATOR
STOVES • AEROLATOR AIR CONDITION-
ERS • WHIRLATOR OIL BURNERS •
NORGE GAS AND ELECTRIC RANGES



THE ROLLATOR... smooth, easy, rolling power instead of hurried back-and-forth action. Result—more cold for the current used and a mechanism that actually improves with use. Only Norge has the Rollator.

NORGE

Rollator refrigeration



ELECTRIC REFRIGERATION NEWS

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VOL. 14, No. 10, SERIAL NO. 311, MARCH 6, 1935

After Two Years

TWO YEARS and two days ago the editor of ELECTRIC REFRIGERATION NEWS stood bareheaded in the drizzling dreariness that enveloped the nation's capitol building and environs on that historic day and listened to President Franklin D. Roosevelt, in his inaugural address, bid the citizens of the United States to be of good cheer, to take courage and have faith, and to support him in measures which he was confident would lead America out of its despondency.

For that self-assured message the United States should be forever grateful. The personality of this man Roosevelt, who is probably one of the greatest salesmen of all time, caught the public fancy to so high a degree that he broke the back of the so-called "psychological depression." People *did* take heart. They did have faith—in Roosevelt—and they did abandon the depths of despair, and once again walked in the sunlight with hope and assurance. The President literally "smiled" the nation out of its funk.

Healing mental and physical ills, however, call for two quite different techniques. Even Christian Scientists will admit that you can't mend a broken arm by smiling at it and telling it that everything's going to be all right. And today, at the second anniversary of his ascendancy to power, President Roosevelt is faced with the fact that all the problems of *recovery* are not to be solved by making people feel good.

Today the nation is bruised and battered from the ordeal of struggling up from the bottom of the business cycle. It needs to have its fractures set and its wounds bandaged, and then be given time for healing, for a natural restoration of powers. Instead of this sane procedure, there is a marked tendency to take advantage of the prostrate condition of the patient to start a series of major operations, to cut and whack away at its vitals with reckless abandon—meanwhile administering expensive shots in the arm which, if the patient survives the butchering, may kill it in the end by making it a dope addict.

President Roosevelt, who has enjoyed powers virtually approaching those of a benevolent dictatorship, is not only ambitious and optimistic but sympathetic. Having suffered severely himself, he wants desperately to do something for and about suffering; and he will valiantly try anything once that promises to relieve almost any species of human misery.

One trouble is that many of the plans have been proposed by dreamers who cannot distinguish between the *desirable* and the *possible*. Thus they have either run into apparently insurmountable obstacles in their paths toward Utopia, or else their drives have ruthlessly damaged and destroyed useful institutions and enterprises and left the prudent, hard-working, substantial citizens of the commonwealth holding the bag.

As the Brookings Institution has demonstrated in its monumental studies, "America's Capacity to Produce," and "America's Capacity to Consume," the idea that there is more than enough to go around, and that all the govern-

ment needs to do to make things dandy is *redistribute*, is a fallacy. Redistribution—at least as the Administration has thus far gone about it—is really dissipation and destruction. Operation of the latter forces may make the underprivileged feel better, but it doesn't help ameliorate their condition.

There are signs, however, that President Roosevelt is awakening to the dangers of his situation. Astute politician that he is, he can't help but hear and heed the growing clamor of public resentment against destructive experimentation. The voices of criticism, at first few and scattered, swelled into a roar over the World Court question, and are now being listened to very respectively by Congress, which has at long last aroused from its spell of drugged hypnotism and begun to assert itself.

Most heartening to objective observers of the situation is the level-headedness of the courts. Judge John P. Nields, whose decision in the Weirton case that, in enacting Section 7-A of the National Recovery Act, Congress exceeded its Constitutional powers, Judge W. I. Grubb, who checkmated the ambitious government-in-business plan of the TVA, and even the United States Supreme Court, with its 5-to-4 decision on the gold clause of contracts, have at least slowed down the movement toward dictatorship and some new form of fascism which was born out of the fears, panic, misery, and chaos of stampeding public sentiment a couple of years ago.

In so doing, the courts have again proved the wisdom of the framers of the Constitution of the United States in providing a system of *checks and balances*. For a time it appeared as if the executive branch of the government would dominate, and thus destroy that system of checks and balances; but the courts stood their ground, holding fast to their rights and powers, and now even Congress is beginning to function as it should.

The trouble with power in the hands of overly-ambitious reformers is that the more they get the more they want. So it was with the preposterous schemes to regulate the intimate, infinite details of everything from laundries and furriers to billion-dollar corporations and the nation's agriculture.

It was simply more than anybody—particularly a motley assortment of politicians—could master. So it has broken down, and now (give thanks for the federal judiciary!) is breaking up.

At the second anniversary of the Roosevelt Administration the nation finds itself in markedly better condition, although at what terrific cost this condition has been purchased it will not know until the bills come in for payment. But even more encouraging are the signs that the Courts, Congress, and public sentiment are combining to put a quietus on the wild hopes and well-meaning but destructive plans of the Great Experimenters.

In the meantime, we are proud to note that the refrigeration industry is continuing to attend to its own business of making a product which the public needs, of selling that product aggressively at a fair price, and doing its share of creating employment and promoting recovery.

WHAT OTHERS SAY

Studies of Air-Conditioning Effects

IN the three of four years since air conditioning began to receive intensive publicity, there has been a remarkable increase in the number of studies of its effects which have been started. We are continually hearing how this and that agency or organization has decided to study some phase of the subject. It is said that there are projects under way to learn the effects on office workers, on factory help, on colds, on hay fever, on pneumonia, on seed germination, on textiles and similar materials.

Most of these studies are slow, and while we hear of their being started, we wait a long time to find out the results. They will come along in due time though, for only recently partial results were reported on two such widely different subjects as egg-laying and wheat-growing. It appears that a least some hens are inspired to greater efforts when they are humidified, while addition of CO₂ to the natural air has an important effect on wheat growing.

These two bits of information, both of which are preliminary, contain such possibilities that they stagger the imagination. Truly this subject of air conditioning is broad. If it is still puzzling in its engineering aspects, take consolation in the fact that its basic effects are still more puzzling to plenty of other people.—*Heating and Ventilating.*

LETTERS

We Want Specifications

Frigidaire Corp.
Calumet Ave. at 21st St., Chicago

Editor:
Would like to know if it is possible to obtain from you information on all makes of refrigerators, which would describe same, such as, capacity and construction.

G. W. FAWCETT,
Service Department.

448 Pleasant St., S. E.
Grand Rapids, Mich.

Editor:
Please advise me whether you are going to publish a household specifications issue of the new 1935 electric refrigerators. If so, when, and what will the price be?

R. T. WEBER.

May Oil Burner Corp.
Baltimore, Md.

Editor:
I wonder if it would be possible for you to give us some information regarding the various types of compressors used in refrigerators.

We are thoroughly familiar with the rollator principle used by Norge, but we would like to know what type compressors are used in the leading refrigerators, such as General Electric, Frigidaire, Fairbanks-Morse, Kelvinator, Leonard, etc., and whether or not these companies manufacture their own compressors or the source from which they purchase them.

We would appreciate any information you can give us along these lines.

J. GEARTNER,
Advertising Department.

Trilling & Montague
Walnut St. at 24th, Philadelphia

Editor:
As the local Norge distributor for eastern Pennsylvania and southern Jersey, we are very much interested in having you place in our hands as quickly as possible your annual refrigeration specification chart which we presume will be released in the immediate future.

If it is humanly possible we would like to get, at least, 25 advance reprints of these specification charts for the use of our organization.

E. S. GERMAIN.

P. S. If you are unable to furnish this information immediately kindly advise by return mail as it is necessary that we prepare them locally if they are not yet available.

Auto Electric Service
304 W. Tipton St., Seymour, Ind.

Editor:
We would like to secure a book on electric refrigeration, one that would give the data and specifications of the leading makes of units and the troubles that each unit has given, with the diagram of each unit.

Do you know any one who publishes a book of this kind? When will you have the 1935 DIRECTORY out?

Would be much pleased if you could give us this information.

W. T. DICKINSON.

D. J. Porreca Bros., Inc.
N. E. Corner Moore at Passyunk Ave.
Philadelphia, Pa.

Editor:
In the past you have listed the different makes of refrigerators according to size, price, and manufacture, so that it makes it very simple for a dealer to compare the different refrigerators on the market.

We would greatly appreciate it if you will advise us in what issue this will be printed this year.

D. J. PORRECA.

Electrical Appliance Shop
4738 Prospect, Kansas City

Editor:
Do you have for 1935 in booklet form "Specifications for Household Refrigerators" and how much are they? I would appreciate your sending me one and if you do not have one will you please let me know where I might obtain one.

L. E. WOLFSKILL.

139 Market St., Passaic, N. J.

Editor:
Can you furnish us detailed information on the present Dayton electric refrigerator?

JOSEPH HOPMAYER.

Electric Appliance Co.
1107 Garrison Ave.
Fort Smith, Ark.

Editor:
We would like to have specifications on all makes of household refrigerators, capacity, melting ice capacity, cost f.o.b. the factory, etc.

Please furnish only specifications of refrigerators being manufactured at the present time, if this information is available.

J. F. McGEHEE.

Answer: Specifications for all models of all makes of 1935 household electric refrigerators will be published in the March 20 issue of ELECTRIC REFRIGERATION NEWS.

Specifications for all makes of air-conditioning equipment will be published March 27.

Specifications of commercial refrigeration equipment will appear in the April 3 issue.

The April 10 issue will be devoted to selling plans and ideas for household refrigerator salesmen.

All four of the above important issues will be mailed to any address in the U. S. for 25 cents. Coin cards especially designed for sending orders for these four issues are available and will be furnished on request for distribution to dealers and salesmen at local meetings.

Reconditioned Units

Oklahoma Thor Co.
718 N. Hudson
Oklahoma City

Editor:
Some time last year while I was a subscriber to your magazine I read an ad placed by some New York City Co. whose business was reconditioning and selling used electric refrigerators of all makes.

I am very much interested in getting in touch with this company or with any other companies which are in that business. If you will be kind enough to furnish me with addresses of some of your customers who are in the above type of business I will appreciate it very much.

JOHN H. COLE.

Carrier Dealers

Gustin-Bacon Mfg. Co.
1412 West 12th St.
Kansas City, Mo.

Editor:
In the January 23, 1935, issue of the ELECTRIC REFRIGERATION NEWS, there was an article on the experiences of Carrier dealers.

We have received several inquiries for additional copies of this, and wonder whether you have any on hand. If possible, would like to get about five extra copies.

We receive the ELECTRIC REFRIGERATION NEWS regularly, and certainly feel that you are doing a wonderful job.

H. M. RUDIO, Mgr.
Air Conditioning and
Refrigeration Dept.

Absorption Refrigerators

Berg und Huttenwerke
Bratislava, Czechoslovakia

Editor:
As subscribers to your periodical it strikes us that in the said paper no other than compressor-refrigerators are ever mentioned. It would interest us very much to hear why to all appearances no absorption-refrigerators are being manufactured and sold by American makers.

We believe that an answer to this question would be of general interest and might perhaps be worth publishing in one of your next issues.

BERG UND HUTTENWERKE.

'Universal Logic'

C. I. T. Corp.
1 Park Ave., New York City

Editor:
In your Jan. 23 issue, as part of your commendable tribute to Mr. G. M. Johnston, you stated that about a year ago you issued a little booklet in which appeared 20 of Mr. Johnston's business sermons.

The few excerpts from this booklet that you reprinted in the Jan. 23 issue impressed me highly, and I would like to secure one of these complete booklets, if at all possible. Not knowing any one in your good company, but yourself, I took the liberty of writing you to ask if you won't be good enough to arrange with your company to send me a copy, if they are still in existence, together with the usual invoice.

E. S. BRINSLEY.

Manufacturers' Sales

Plainview, Texas

Editor:
In the Jan. 2 ELECTRIC REFRIGERATION NEWS, you stated that the total sales of electric refrigerators for 1934 was 1,400,000 units. If you have the figures available please advise me what per cent of these sales were made by Frigidaire, Kelvinator, and Norge refrigerators.

M. E. SIDEBOTTOM.

Answer: We are not able to supply you with a breakdown of household electric refrigerator sales by individual manufacturers.

Wants Every Issue

Fresno, Calif.

Editor:
Kindly enter my subscription to your weekly paper which is really my "Bible." I am on the road in education department for Refrigeration & Air Conditioning, and have kept up with your paper through Public Library Service—but I miss some issues occasionally, and want to subscribe to insure obtaining each issue.

Please start with issue of Feb. 6, 1935, and bill me when you get ready, for one year.

ELBERT HYMER.

4 coming issues for dealers & salesmen *to Start the 1935 Selling Season*

Containing **COMPLETE SPECIFICATIONS** for every model of every make of household and commercial electric refrigeration and air conditioning equipment.

PLUS the best selling arguments as to the merits of their respective equipment, parts and materials which the manufacturers of each product have to offer.

1. MARCH 20

SPECIFICATIONS for 1935 HOUSEHOLD ELECTRIC REFRIGERATORS

These specifications will be complete, including types of systems; capacities, dimensions, prices, cabinet construction details; machine construction details, types of controls, makes of parts and materials used; special features, etc.

2. MARCH 27

SPECIFICATIONS for 1935 AIR-CONDITIONING EQUIPMENT

This issue will contain full specifications—types of systems, capacities, prices, machine construction details, makes of motors, controls, and parts; refrigerant used, special features, etc.

3. APRIL 3

SPECIFICATIONS for COMMERCIAL REFRIGERATION EQUIPMENT

Full specifications, including types of systems; sizes, capacities, and functions performed; construction details, makes of parts and materials used.

4. APRIL 10

HOW TO SELL ELECTRIC REFRIGERATION IN 1935

This will include the best selling ideas of the principal manufacturers of electric refrigerators and will be invaluable to distributors, dealers, and salesmen.

Attention:

Manufacturers of Household and Commercial Electric Refrigeration and Air-Conditioning Equipment and Manufacturers of Parts, Materials and Accessories

These issues are made to order to inaugurate your spring advertising campaign to the trade. This is the beginning of the selling season. Every dealer and salesman will need these specifications issues in his selling kit. Use these issues to tell the dealer and

salesmen *how to sell* your product to the prospective user.

All four of these issues will have *double circulation value*. Each issue will go to at least 15,000 paid subscribers. We have always had a

very big demand for extra copies of specification issues. Everybody wants them. They are kept and consulted throughout the entire selling season.

Remember the dates—March 20 and 27, April 3 and 10.

ELECTRIC REFRIGERATION NEWS

Business News Publishing Co., 5229 Cass Ave., Detroit

STATISTICS

Refrigerator Most Wanted Appliance By Jersey Women

NEW YORK CITY—Queried as to the electrical appliance they planned to buy next, a group of 1,017 New Jersey housewives, interviewed recently by editors of *McCall's* magazine, voted the electric refrigerator into first place.

Asked to vote on the five most essential household electrical appliances, the New Jersey housewives picked the electric refrigerator, the electric flatiron, the home radio set, the floor-type vacuum cleaner, and the clothes washing machine. Runners-up in the contest were the electric toaster, the clock, the sewing machine, the coffee percolator, and the kitchen food mixer.

Owned 8,882 Appliances

It was also discovered that these 1,017 housewives, who attended 13 home-making lecture classes in nine New Jersey communities, owned 8,882 electrical appliances or an average of 8.73 appliances per home. The women told *McCall's* investigators that only 222 of the electrical appliances in their homes, or 2½ per cent, were not in use.

Most frequent reason given for not using an idle appliance was "out of repair." Other causes for not operating appliances that had already been bought were given as "not needed," "too expensive to run," "too much trouble," "superseded by other devices," "no convenient outlet," etc.

Most significant was the disclosure that of the appliances owned but not in use, almost 30 per cent were out of repair.

Unused Appliances

Heating or table-type electrical appliances are found most often among the appliances that are owned but not used. The 10 appliances most frequently mentioned by the housewives in New Jersey to *McCall's* editors as being owned but not used, were the radiant heater, percolator, waffle iron, fan, cleaner, washer, toaster, radio set, clock, and grill.

Market saturation on various types of appliances, in this group of New Jersey housewives, was discovered to be as follows:

Appliance	Percentage
Iron	96.5
Radio	95.6
*Floor-type vacuum cleaners	76
Toaster	73
Clocks	53.5
Waffle iron	51
Refrigerator	44.2
Washing machine	41
Percolator	39.1
Fan	35.1
Sewing machine	31.9
Heater	30.2
Sandwich toaster	29
Heating pad	22.6
*Hand vacuum cleaner	20.1
Mixer	17.7
Grill	14.1
Sun lamp	13.7
Juice extractor	12
Coffee maker	11.7
Hair dryer	8.1
Range	7.9
Ironer	6
Hot plate	4.5
Ventilating fan	4.3
Egg cooker	2.9
Roaster	2.9
Dishwasher	1.3

(*) Floor and hand type vacuum cleaners listed separately.

(†) Percolators and coffee makers listed separately.

The balloting by the women on the appliance they would buy next showed the following results:

Appliance	Votes
Refrigerator	231
Mixer	160
Washing machine	136
Sewing machine	53
Ironing machine	56
Floor type vacuum cleaner	34
Range	31
Dishwasher	20
Waffle iron	19
Clock	12

Oil Burner Manufacturers Report Gain in Orders

WASHINGTON, D. C. — Recent figures from the Bureau of the Census on 149 domestic oil burner manufacturers indicate that new orders for domestic burners and units in 1934 totaled 89,708, an increase of 21.08 per cent from the 74,086 reported by the same manufacturers in 1933.

Shipments of domestic burners and complete units from the plants of the reporting manufacturers totaled 88,903 for 1934 against 74,273 the year before, a gain of 19.7 per cent.

Operating Averages of Dealers Analyzed by Dun & Bradstreet

NEW YORK CITY—Analysis of the 1933 operating averages of 58 retailers of refrigerators and refrigerating apparatus by Dun & Bradstreet, Inc., shows that a 1933 net profit was reported by 36 concerns and a 1933 net loss by 22 concerns of those investigated.

Total 1933 net sales for the 58 firms was \$3,826,700. Total 1933 net sales for the 36 concerns reporting a net profit, was \$3,118,000, or 81.48 per cent of the total volume. Total 1933 net sales for the 22 concerns reporting a net loss was \$708,700 or 18.52 per cent of the total volume.

Operating factors and overhead factors of both groups are shown in the following tabulation:

Operating Factors	Averages of 36 concerns reporting a net profit for 1933	Averages of 22 concerns reporting a net loss for 1933
1. Net Profit, or Net Loss	12.61%	12.23%
2. Total Overhead Expense	35.55%	42.63%
3. Cost of Goods Sold	53.36%	73.44%
4. Mark-up	105.20%	42.23%
5. Inventory Turnover (Times)	7.50	5.09
Overhead Factors		
6. Salaries of Owners or Officers	6.65%	10.39%
7. Employees' Salaries and Wages	9.58%	9.71%
8. Rent	6.46%	3.71%
9. Advertising	1.38%	1.45%
10. Light, Heat, and Gas	1.04%	1.58%
11. Taxes	0.97%	1.14%
12. All Other Expense	7.38%	7.78%

In the table giving an analysis of operating averages by sales volume of the 36 concerns reporting a net profit, it is interesting to note that the highest net profit, 31.25 per cent, was shown by concerns in the \$5,000 to \$10,000 net sales group as compared with the lowest net profit, 3.10 per cent, which was found in the \$500,000 to \$1,000,000 net sales group.

In the analysis of operating averages by population groups of the same 36 concerns it was found that the highest net profit, 33.37 per cent, occurred in cities of 5,000 to 10,000 as compared with the lowest net profit, 4.48 per cent, found in cities of 100,000 to 250,000.

In Table 2A showing 1933 operating averages by population groups of the 22 concerns, which reported a 1933 net loss, the largest net loss, 33.47 per cent, was found in cities of 5,000 to 50,000, and the lowest net loss, 4.60 per cent, occurred in cities of 2,500 to 5,000 population.

LETTERS ON STATISTICS

Refrigerators in Use

The American Weekly International Magazine Building
959 Eighth Ave., New York City
Editor:

Would you be good enough to send us a list of the number of electrical refrigerators in use, by states, for 1934.

H. SPINNER,
Plan and Research.

Answer: We do not have tabulations showing the number of electric refrigerators in use in each of the various states. Sales of household electric refrigerators to distributors and dealers in each of the states during 1934 will be published in the 1935 REFRIGERATION MARKET DATA BOOK.

The REFRIGERATION DIRECTORY AND MARKET DATA BOOK is being issued in two volumes this year. Volume I will contain lists of manufacturers of refrigeration products while Volume II, the MARKET DATA BOOK, will contain all available statistical data.

Monthly Sales Trend

Knickerbocker Ice Co.
41 East 42nd St., New York City
Editor:

If available in your files, will you advise the writer the sales trend month by month showing the peak and valley selling periods in the domestic, commercial, and water cooler divisions of mechanical refrigeration. Your assistance in this matter of furnishing the above information will be greatly appreciated.

Answer: On page 13 of the Feb. 20 issue of ELECTRIC REFRIGERATION NEWS is a chart showing the monthly trend of household electric refrigerator sales for the years 1930 to 1934.

Table 1—Analysis of Operating Averages by Sales Volume

A. 1933 Operating Averages of 36 Concerns Which Reported a 1933 Net Profit

Analysis of Net Sales							Analysis of Overhead						
Net Sales Group	Number of Concerns	Net Profit %	Total Over-head %	Cost of Goods Sold %	Mark-Up %	Inventory Turnover (Times)	Salaries, Owners, or Officers	Em-ployees'	Rent %	Adver-tising %	Light, Heat and Gas	Taxes %	Other Ex-pense %
							%	%			%		%
Over \$1,000,000	1	3.10	19.80	77.10	29.80	12.80	2.10	4.90	0.90	1.00	0.20	0.20	10.50
\$500,000 to \$1,000,000	3	9.60	33.53	57.47	82.20	23.30	4.50	11.75	1.00	1.43	2.16	1.90	8.13
250,000 to 500,000	3	4.00	36.83	59.17	76.20	14.37	5.20	13.63	1.70	2.50	0.50	0.33	6.95
100,000 to 250,000	6	9.55	29.23	56.35	81.82	5.65	5.44	10.64	2.17	1.48	0.92	0.97	6.83
50,000 to 100,000	9	8.70	39.44	51.63	124.71	8.73	5.42	12.37	2.29	0.83	0.54	0.53	8.60
25,000 to 50,000	6	20.30	29.68	50.02	133.77	5.48	7.05	7.04	4.02	1.35	1.30	1.63	5.57
10,000 to 25,000	3	31.25	44.30	14.40	22.40	5.07	13.65	8.25	3.20	2.50	0.70	0.30	2.75
5,000 to 10,000	5	15.46	35.90	54.02	126.28	4.83	9.80	2.55	2.85	1.26	1.62	1.00	8.03
2,500 to 5,000													
Under \$2,500													

B. 1933 Operating Averages of 22 Concerns Which Reported a 1933 Net Loss

Analysis of Net Sales							Analysis of Overhead							Other Ex- pense %
Net Sales Group	Number of Concerns	Net Loss %	Total Over- head %	Cost of Goods Sold %	Mark- Up %	Inventory Turnover (Times)	Salaries, Owners, or Officers	Em- ployees'	Rent	Adver- tising	Light, Heat and Gas			
							%	%			%	%	%	
Over \$1,000,000	.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
\$500,000 to \$1,000,000	.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
250,000 to 500,000	.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
100,000 to 250,000	.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
50,000 to 100,000	5	6.02	31.72	74.30	35.72	5.10	7.78	8.02	2.78	1.96	0.70	0.38	7.93	
25,000 to 50,000	7	4.04	36.70	69.72	50.34	4.60	10.34	10.33	1.80	0.98	1.14	1.16	8.30	
10,000 to 25,000	7	16.06	50.66	74.58	44.45	5.62	11.16	8.83	5.18	1.20	1.92	1.32	8.47	
5,000 to 10,000	1	32.20	54.70	77.50	29.00	1.80	19.90	17.30	.....	.....	5.80	6.90	4.80
2,500 to 5,000	2	34.10	56.55	77.55	30.10	3.60	.....	12.00	7.20	2.35	3.60	.....	5.00
Under \$2,500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Table 2—Analysis of Operating Averages by Population

A. 1933 Operating Averages of 36 Concerns Which Reported a 1933 Net Profit

Analysis of Net Sales						Analysis of Overhead							
Population City—Town—Village	Number Concerns	Net Profit %	Total Over- head %	Cost of Goods Sold %	Mark- Up %	Inventory Turnover (Times)	Salaries, Owners, or	Em- ployees'	Rent	Adver- tising	Light, Heat and Gas	Taxes	Other Ex- pense
							%	%			%		%
Over 1,000,000	3	11.93	43.77	44.30	182.13	9.93	4.80	10.00	2.43	1.13	0.80	0.70	8.90
500,000 to 1,000,000	3	4.57	36.30	59.13	71.83	4.10	4.35	13.25	1.90	1.20	1.10	2.05	10.50
250,000 to 500,000	4	12.80	43.88	54.60	88.37	6.90	4.40	11.12	2.60	2.38	0.82	0.25	5.25
100,000 to 250,000	4	4.48	44.08	53.70	117.23	9.55	6.67	7.57	2.78	0.85	0.73	0.50	9.43
50,000 to 100,000	7	10.86	29.34	59.80	71.19	8.86	6.14	9.97	1.42	1.70	1.30	1.54	5.56
25,000 to 50,000	4	12.50	48.95	28.97	138.23	5.03	13.65	8.03	2.88	0.63	0.62	0.73	6.03
10,000 to 25,000	3	9.30	31.03	59.67	65.07	8.10	5.60	11.93	1.97	1.27	0.40	0.55	9.63
5,000 to 10,000	3	33.37	27.23	39.40	193.43	8.50	.....	12.05	3.80	1.30	1.37	1.05	4.60
2,500 to 5,000 .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Under 2,500	5	16.24	22.00	64.36	76.64	5.35	8.85	6.40	2.48	1.40	1.56	0.78	5.70

B. 1933 Operating Averages of 22 Concerns Which Reported a 1933 Net Loss

Analysis of Net Sales							Analysis of Overhead							Other
Population	Number	Net	Total	Cost of	Mark-	Inventory	Salaries,	Em-		Adver-	Light,		Ex-	
City—Town—Village	of	Loss	Over-	Goods	Up	Turnover	or	ployees'		tising	Heat	Taxes	pense	
	Concerns	%	head	Sold	%	(Times)	Officers	Salaries	Rent	%	and	%	%	
			%	%	%		%	%	%	%	Gas	%	%	
Over 1,000,000														
500,000 to 1,000,000	2	4.70	39.25	77.70	58.35	6.20	9.95	1.50	2.50	1.35	0.60	0.20	10.40	
250,000 to 500,000														
100,000 to 250,000	3	5.60	43.93	66.65	64.63	4.80	10.00	10.83	3.00	1.20	0.43	0.40	4.80	
50,000 to 100,000	2	14.15	58.95	77.20	29.60	4.10	13.35	8.00	3.25	1.40	0.95	0.60	1.00	
25,000 to 50,000	3	33.47	55.93	77.53	29.40	2.70	19.90	14.65	7.20	2.35	4.70	6.90	4.90	
10,000 to 25,000	6	14.78	40.93	73.85	36.48	5.96	7.94	9.28	4.58	1.88	1.68	0.73	12.58	
5,000 to 10,000	3	4.70	31.43	73.30	37.60	5.60	9.60	8.30	3.05	1.05	2.40	1.03	3.15	
2,500 to 5,000	2	4.60	35.30	69.30	44.40	2.25	12.05	12.65		0.70	1.10	1.75	7.05	
Under 2,500	1	4.30	31.40	72.90	37.00		7.90	8.50	2.70	0.90	1.50	0.30	9.60	

We have not as yet compiled similar charts for commercial condensing units and water coolers, but hope to have this information for publication in the 1935 REFRIGERATION MARKET DATA BOOK which is now being prepared for publication. The MARKET DATA BOOK will contain all available statistical information on household and commercial refrigeration.

Wired Home's Data

Ochiltree Electric Co.
Distributor G-E Refrigeration
505 Liberty Ave., Pittsburgh
Editor:

We are informed by the General Electric Co. in Cleveland that you publish a "Refrigeration Directory" showing the number of wired homes in the counties of the United States, and that the 1935 issue will be available in about a month.

We are very much interested in this DIRECTORY, and we would like to know if the counties are broken down into boroughs, cities, and townships, and also what the price of this DIRECTORY is for 1935 issue.

V. R. STAFFORD,
Manager Wholesale Department.

Answer: The statistical data to which you refer in your letter will appear in Volume II of the 1935 REFRIGERATION DIRECTORY AND MARKET DATA BOOK, which will contain all market data and statistical information pertaining to the electric refrigeration industry.

Included in this MARKET DATA BOOK will be a section showing the number of wired homes in all cities and towns in the United States of over 2,500 population as well as in the counties of each state. The original survey was made by the National Electric Light Association in 1932, and was published in the 1932 edition of the REFRIGERATION DIRECTORY.

During 1933, a survey was made among public utilities to obtain revised and up-to-date information concerning the number of wired homes in

the communities which they serve. Information was returned by about 100 of these companies.

During 1934 a further survey was made among companies which had not answered the first questionnaire to obtain revised figures. This information will be incorporated in the wired home section in the 1935 edition.

1934 Sales Total

Walker & Downing
Oliver Building, Pittsburgh, Pa.
Editor:

Can you tell me how many electric refrigerators were sold during 1934?

H. S. DOWNING.
Answer: The complete analysis of sales during 1934 and also a tabulation of the sales record for past years was published on page 13 of the Feb. 20 issue of ELECTRIC REFRIGERATION NEWS.

Sales by States

408 Wesley Temple
Minneapolis, Minn.
Editor:

Each week I have been scanning ELECTRIC REFRIGERATION NEWS, to which I am a subscriber, for a tabulation, according to states, of the number of electric refrigerators sold during 1934. So far this has not appeared, unless I missed an issue, or perhaps it is still unpublished and will appear in a later number.

I am very anxious to have this data and would appreciate receiving it from you, in the event that it will not be published in a future NEWS, or advice as to where I may procure such a compilation.

NONA FITZGERALD.
Answer: The tabulation by states of household electric refrigerators sold during 1934 has not as yet been published in ELECTRIC REFRIGERATION NEWS. However, we hope to have this information ready for publication in an early issue, as the data are being assembled at the present time.</

Bragg Appointed to Highest Position in Quota Busters Club

MANSFIELD—Nine officers were recently named for the Westinghouse "Quota Busters Club," an organization of "star" Westinghouse refrigerator salesmen. Officers for 1935 are as follows:

Rancher and director, R. C. Bragg, Alca Electric Co., Vallejo, Calif.; director, E. F. Brown, Central Maine Power Co., Augusta, Me.; director, H. G. Ratner, Appliance Sales Co., Greensburg, Pa.

Ranch superintendents: R. W. Badgro, Walz Hardware Co., Saginaw, Mich.; H. G. Meyer, Modern Appliance Co., Hammond, Ind.; C. White, Claxton White Electric Co., Pittsburgh, Calif.

Ranch foremen: Robert Sofer, Danforth Co., Pittsburgh, Pa.; L. E. Van Horn, Central Power & Light Co., Uvalde, Tex.; and C. H. Foss, Black Hills Radio Co., Lead, S. D.

Admittance to the club is based on the salesman's performance against his quota, which is determined and established on a credit system which is based on potential sales opportunities in a year's time.

Membership is divided into three classes: Class "A" for the metropolitan districts where sales opportunities are high; Class "B" for the suburban and smaller towns, where opportunities are not so great; and Class "C" for the sparsely settled sections of the country where the opportunities are comparatively low.

400 Exhibits Planned For Furnishings Show

NEW YORK CITY—Approximately 400 manufacturers are scheduled to exhibit at the 1935 Housefurnishings Show to be held at the Hotel Pennsylvania here from July 10 to 19.

Housefurnishing and appliance exhibits will be located on the third, fourth, and fifth floors. China, glass, and pottery exhibits (including refrigerator accessories) will be on the sixth floor of the hotel.

Officers of the association are: Stanley T. Williams, The Vollrath Co., president; A. A. Bernardine, National Enameling & Stamping Co., vice president; Robert D. Price, Robeson Rochester Corp., treasurer; and Mrs. Flo English, secretary.

Fargo Dealership Officials Visit Crosley Factory

CINCINNATI—H. B. Bonde, treasurer and manager of Fargo Motor Supply Co., Inc., Crosley distributor for Fargo, N. D., recently visited the factory of Crosley Radio Corp. here.

Representatives of the motor supply company who accompanied him were C. C. Flom, O. W. Person, P. J. Thompson, Iver Iverson, and F. W. Manning.

Liberal Credit Policy & Ample Stock Builds Crosley Dealer's Sales

ANDERSON, Ind.—In this town of about 40,000 population, Bob Brown's Radio Store, Crosley dealer, sold more than 300 Shelvador electric refrigerators and about 500 radios during 1933 and 1934.

Bob Brown, manager, attributes his firm's success to several factors, among them its central location, its policy on time payment sales, and the fact that a complete line of refrigerators and radios are carried at all times.

The Brown Radio Store is located on a downtown corner, right next to the town's leading moving picture house, and most townspeople pass by it at least once a day. The store's two show windows are kept well trimmed, and merchandise is given prominent display.

About refrigerator time payment sales, Mr. Brown says:

"Our minimum down payment is \$10, and we will sell any of our models on that basis. We trade in old ice boxes, but not as part of the down payment. Our maximum time limit is 18 months, and has proved very satisfactory, because by the time a customer has made six or seven payments the account is on the safe side of the ledger."

The store has not as yet used the meter plan in selling refrigerators, but plans to carry meters this year in case they become necessary.

"But we will still require the \$10 down payment," Mr. Brown says. "We will not sell on the meter plan with no down payment."

The store has its own arrangements for financing time sales.

A complete line of refrigerators and radios is carried by the store at all times, and Mr. Brown believes it helps increase sales.

"If you don't have a certain model on the floor the customer invariably wants to see that one, and not having all models on the floor creates resistance even in the salesman's mind. He thinks the customer will want to see that particular refrigerator or radio, and it weakens his story. We feel that it is necessary to carry a complete stock at all times."

Mr. Brown also believes in carrying only one make of merchandise, because it cuts down inventory and gives salesmen a stronger story on what they are selling. His experience has been that with competitive lines sales come hard, requiring much sales talk, price quibbling, frequent calls, and dangerous long payment terms.

The firm switched to an exclusive dealership in 1933, and immediately noticed an increase in refrigerator sales. In one afternoon, Mr. Brown said he sold eight Shelvadors from his sales floor to people he had never canvassed, and only one of them was a regular customer. He credits radio station WLW with doing much of the Crosley promotional work for him.

Seeger

BOSTON



The Boston Branch (illustrated above) of the Seeger Refrigerator Company, at 644 Beacon Street, Boston, Mass., may well be proud of its record of correctly supplying the Refrigeration needs of the New England States.

Many of the aristocratic homes, hotels, hospitals, restaurants, institutions, colleges, apartment houses, grocery and meat shops have obtained the best refrigeration equipment, through the cooperation of the Boston Branch with Dealers and Distributors of Electrical Refrigeration.

For speedy delivery, a complete warehouse stock of standard models, consisting of Commercial and Residence Cabinets, Display Cases and Beer Cooling Equipment, is maintained. Expert and experienced advice on special refrigeration equipment for unusual requirements, is yours for the asking.

Seeger Service is at your disposal at all times.

Seeger Refrigerator Company

Saint Paul - Minnesota

New York, N. Y.

Los Angeles, Calif.

Boston, Mass.

Philadelphia, Pa.

Chicago, Ill.

San Francisco, Calif.

'Cut Yourself a Piece of Cake'



R. C. Cosgrove, manager of Westinghouse household refrigeration sales, cuts a cake containing 312 egg whites and 45 lbs. of flour at a banquet for 850 dealers in Chicago, while the Stevens Hotel chef looks on.

AIR CONDITIONING

62% of Conditioner Systems in Louisville Installed During 1934

LOUISVILLE—More than twice as many installations of air-conditioning equipment for commercial, industrial, and residential use were made in Louisville during 1934 than were sold in Louisville in all previous years, according to a summary compiled by the Louisville Gas & Electric Co. under the supervision of W. D. Myers, sales manager.

Thirty-one, or 62 per cent, of the 50 air-conditioning systems now in use in the city were installed last year, the report shows.

Most striking gain noted in the survey was the increased use of air conditioning in Louisville homes. Eleven installations in residences were reported last year to mark the first use of home air conditioning in the city's history.

Seven offices were also air conditioned last year, to give installations in that classification their initial impetus.

Biggest users of air conditioning in the city, in point of connected horsepower load, are the theaters, seven of which now have systems in use. Only one of these, the Lyric, was equipped last year, the others, led by Loew's, starting their air-conditioning activities as early as 1928.

Probably the largest single user of electric power for air conditioning is the American Tobacco Co., which in 1929 installed a system of 280-hp. load.

The studios of radio station WAVE were air conditioned last year, and are now the only ones in the city to be so equipped. Business establishments installing systems last year included the Louisville Taxicab & Transfer Co., Kresge's 5 & 10 cent Store, Brown Hotel grill, Jutt's Bar, the French Village, Canary Cottage, Byck's, Stewart Dry Goods Co., Lee Cralle, and Kunz.

Although outranking the city's previous installations in number, 1934 figures fell considerably short of previous years in average size of connected horsepower rating, as will be noted from the following table:

	No. of Installations	Total Connected Hp.	Average Per Installation
During 1934 ..	31	318.65	10.27
During 1933 ..	11	261.5	23.75
Before 1933 ..	8	751	93.87

Louisville Air-Conditioning Installations

Type of Establishment	Prior to 1933 No.	During 1933 No.	During 1934 No.	Total Thru 1934 No.
Theaters	5	1	1	7
Industrial	1	2	1	4
Stores	1	5	3	9
Restaurants .....	..	3	2	5
Offices .....	..	..	7	7
Residences .....	..	..	11	11
Photoengraving	1	15	..	16
Hotel .....	..	1	5.5	6.5
Hotel Restaurants .....	..	1	8	9
Taprooms .....	..	..	1	1
Radio Studios .....	..	..	1	1
Miscellaneous .....	..	2	28	30
Totals	8	751	11	1,331.15

Prof. Kratz Will Talk To Detroit Engineers On Comfort Cooling

DETROIT—Members of the Detroit Section of the American Society of Refrigerating Engineers (A.S.R.E.) will be guests of the Detroit Section of the American Society of Heating & Ventilating Engineers (A.S.H.V.E.) at a dinner meeting devoted to "Summer Cooling" which will be held Monday evening, April 1, at the Wardell hotel.

Headliner of the meeting will be Prof. Alonzo P. Kratz of the University of Illinois who has become recognized as one of the foremost authorities on air conditioning as a result of his extensive experiments with various types of equipment installed in an average type of middle west home operated by the Engineering Experiment Station, University of Illinois.

This research residence and its air-conditioning equipment were described by Prof. Kratz at the January meeting of the A.S.H.V.E. (See report, diagrams, and operating data on pages 14, 15, 16, and 17 of the Feb. 27, 1935, issue of ELECTRIC REFRIGERATION NEWS).

John Howatt, national president of the American Society of Heating & Ventilating Engineers, will attend the Detroit Section meeting and will discuss the necessity for the establishment of definite standards for air conditioning and the need for public education regarding the health features of indoor air control.

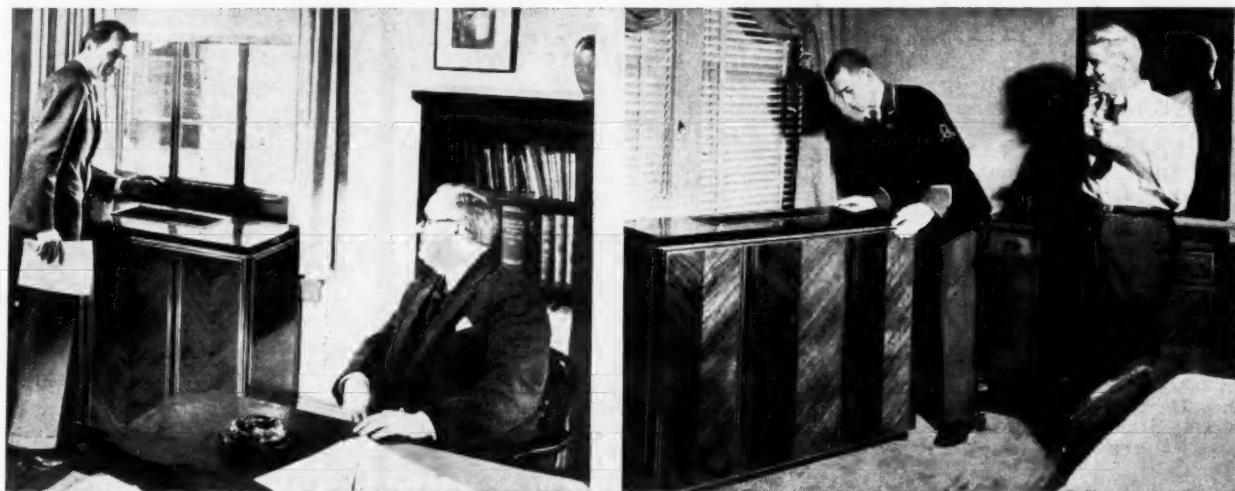
George Helmrich of the Detroit Edison Co. will give a brief explanation of results obtained from a recent installation of air-conditioning equipment in a research home in Birmingham, Mich.

All refrigeration engineers are invited to attend this meeting and are requested to make advance reservations for the dinner by telephoning Secretary W. F. Arnold, Randolph 6250, or by writing him at 2847 Grand River Ave., Detroit. The dinner will be served at 6:30 and the program will begin at 8 p. m.

Stewart Dept. Store Sells G-E Lines Only

BALTIMORE—Stewart & Co., department store at Howard & Lexington Sts. here, has re-entered the electric refrigeration field and is featuring the General Electric line.

York's New Conditioner Has Stylish Finish



Two views of York Ice Machinery Corp.'s new portable room-type air conditioner in typical application. In the office scene at the left the individual standing is shown testing the flow of air from the conditioned air outlet. The air intake for recirculated air can be seen on the side of the cabinet in this picture. In the hotel room scene on the right, the portability of the conditioner is demonstrated. An air-cooled refrigeration unit is used, the heat removed from the room being vented to the outdoors by means of an adjustable window sash connection.

Air-Cooled Refrigerating Machine Is Used In York Self-Contained Conditioner

(Concluded from Page 1, Column 5)

introduction into the room, and also for cooling the refrigerant condenser.

It is mounted on rubber-tired ball-bearing casters so that it can be rolled over polished floors without marring them.

York's new conditioner is intended especially for single room applications, such as dentists' and doctors' offices, hotel and hospital rooms, private offices, and homes, and will be sold as a "packaged" item.

Heat removed from the room air, and moisture which results from dehumidification, are both discharged to the outside atmosphere through the duct arrangement, thereby eliminating the need of water supply and drain pipe.

Adjustable Window Sash

The window sash is adjustable to fit window widths from 31 1/4 to 51 in., or with special cutting to as narrow as 22-in. windows. This duct connection is comprised of three sections; first an air inlet to the condenser, second an air outlet from the condenser, and third the fresh air inlet to the evaporator fan and conditioned room. Hand damper control of fresh air is incorporated in the cabinet.

Condensed moisture from the evaporator is drained to the condenser air stream and there re-evaporated by a novel type of condensate vaporizer which operates between divided sections of the air-cooled condenser. To aid in liquid cooling, the receiver is mounted between condenser coils in contact with the condensate vaporizer spray.

For compactness and rigidity, the York two-cylinder Freon compressor is mounted above the motor. The compressor has a 1 1/4-in. bore and a 1 1/2-in. stroke, and is driven by V-belts from a 3/4-hp. motor.

5% Ton Capacity

The conditioner has a cooling capacity of approximately 5% ton of refrigeration, depending upon temperature and humidity conditions.

The evaporator is a new type of single-pass, hot tin dipped, copper fin coil, specially designed to permit operation of the refrigerating system at the most efficient suction pressures possible and still maintain a comfortable relative humidity in the conditioned space.

A 9-in. radial type fan circulates about 270 cu. ft. of room air per minute, of which approximately 25 per cent may be fresh air introduced from the outside. Recirculated air is drawn in through a louvred opening in the right side of the cabinet.

According to designers of the unit, thorough diffusion and draft-free circulation of air in a room is attained with a relatively large air circulation per ton of refrigeration, and a high air velocity discharging upward and outward. The air inlet in the side of the cabinet aids in producing circulation and thus avoids dead spots.

Cleanable filters are provided on both fresh air intake and on recirculated air intake.

Adjustable Control System

The control system has been designed so that it is easily adjustable to meet the individual needs of a customer.

One switch controls the room air circulating fan only so the user can have circulation and fresh air ventilation by taking numerous measures to

insulate the cabinet and isolate the refrigerating unit, a sound level has been obtained which is claimed to be lower than that of an ordinary desk fan.

Isolation of the motor-compressor unit from the framework is accomplished by floating it on rubber. Sound transmission from the compressor to the evaporator is reduced by flexible refrigerant connections. Isolation of air circulating fans and motor are also obtained by suspended rubber connections.

Sound transmission through the inner casing is prevented by a felt lining on all metallic parts, and sound transmission only when cooling is unnecessary. A second switch provides complete summer air conditioning by starting up the refrigerating machine, the condenser cooling fan, and the evaporator fan. Both switches are located in a recess below the hinged air supply grille in the top of the cabinet, absorption by the external decorative casing is obtained by a heavy inner lining of sound absorbing material.

Standard accessory equipment includes a non-adjustable thermostatic expansion valve, a liquid line strainer, a compressor control switch with overload cut-out protection against extreme voltage variations, and a fusible safety plug to avoid fire hazard.

Mechanical Cooling Systems Predominate In Railway Field

PITTSBURGH—Air conditioning of trains, largely in the experimental stage only five years ago, has expanded to where more than a dozen firms are now engaged in supplying this equipment to railroads, according to figures compiled by the Kerotest Mfg. Co.

At present, 3,000 cars have been equipped, and between \$4,000,000 and \$5,000,000 in orders are either pending or being filled at present.

Leaders in the field are Pennsylvania Railroad, with 680 cars air cooled or air conditioned; New York Central, with 500 cars; Baltimore & Ohio, with 260, and New York, New Haven & Hartford, with 152.

Western railroad lines, which at first delayed large-scale installations, are now adding large numbers of the improved cars. The Santa Fe railroad recently announced plans to have about 370 air-conditioned cars in service before the end of 1935.

Railroads placed 648 cooled or conditioned cars in service during 1933, and 1,878 in 1934, to bring the total past the 3,000 mark. About half of this number are owned by the Pullman Co.

An analysis of installations revealed that 792 of the cars in service were utilizing ice, 197 the steam ejector principle, and 932 mechanical refrigeration equipment, with a marked preference for the latter type indicated in recent jobs.

Kerotest Mfg. Co. claims that its brass forged refrigeration valves and fittings were used on some 759, or 81 per cent, of the 932 mechanical refrigeration installations completed to date.

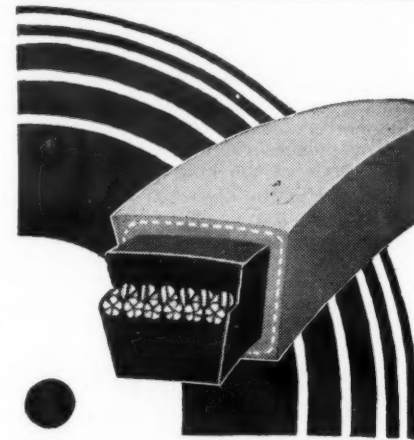
Carrier to Condition Air In Wells Fargo Bank

SAN FRANCISCO—Cochran & St. John, distributor here for Carrier air-conditioning products, have been awarded a contract for air conditioning two banking rooms in the Wells Fargo Bank of San Francisco. Cost of the project is about \$5,000.

Ice Will Be Used Again For Cooling Trains of Great Northern

CHICAGO—The Great Northern Railway is sticking to ice for the air conditioning of its trains, according to a recent announcement.

After a year of experimentation, the Great Northern has announced that all passenger equipment on its transcontinental flyer, the Empire Builder, will be cooled with ice henceforth. This method of air conditioning was applied to observation cars and diners last year.



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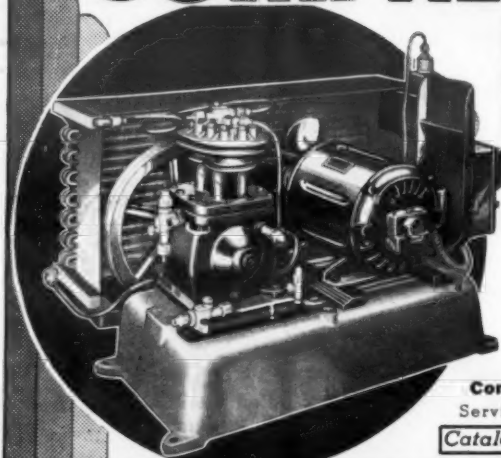
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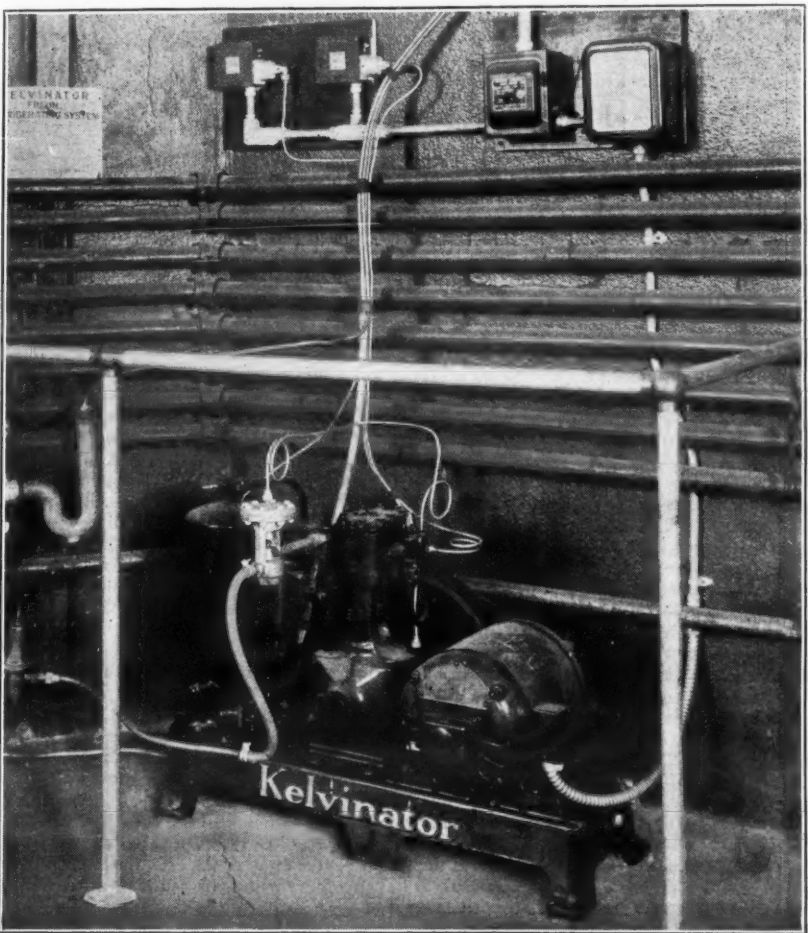
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AIR CONDITIONING

Cool Comfort for Manhunters



A Kelvinator cabinet air conditioner makes conditions comfortable for this Kansas City police radio announcer, as he directs the movements of squad cars from a sealed and insulated studio at headquarters.



The Kelvinator condensing unit which supplies refrigeration for the air conditioner pictured above is installed in a corner of the court room adjoining the studio, and is surrounded by a metal guard rail.

Users Experiences Indicate Comfort Cooling Pays for Itself, Says Utility Engineer

BIRMINGHAM, Ala.—What air conditioning costs in terms of square footage of the area conditioned and whether the cost in the long run will pay itself was the subject of a study made last year by Chester Gause, air conditioning and power sales engineer for the Alabama Power Co.

Mr. Gause concluded, after checking the experiences of establishments in which air conditioning had been installed, that comfort cooling more than paid for itself. Says he:

"As to the cost of air conditioning, an air-conditioning system must be made to fit a particular set of conditions. It is very difficult to give you any rule of thumb method of estimating an air-conditioning job.

"Air conditioning doesn't cost—it pays, and when you ask what is meant by this, I reply, exactly what I say.

Delay Costs Money

"A restaurant owner, a specialty shop, and any other commercial places of business will pay for their air conditioning twice by delaying the installation. He will lose to his competitor, who has air conditioning installed, sufficient volume of business to pay for the competitor's installation before he actually proceeds with his.

"Then, of course, it will be necessary for him to pay for the installation in his place of business.

"The wide-awake merchandiser realizes the importance of being first in any movement in which the public is so vitally curious and interested as air conditioning.

"In one restaurant, air-conditioning equipment installed at a cost of \$3 per sq. ft. of floor space increased the patronage 50 per cent. An increase

of only 7 per cent of the daily patronage paid for the system.

"In one of the largest department stores in the state, air-conditioning equipment increased the dollar volume of sales 25 per cent. The installation cost was approximately \$1 per sq. ft. of floor space, and the annual cost of operation was approximately 3 cents per sq. ft.

Cost Per Foot

"In small specialty shops, air conditioning can be installed at a cost of from \$1.50 to \$2.50 per sq. ft. of floor space. The annual average cost of operation is about 10 per cent of the installation cost.

"One shoe store in Birmingham has found that its installation of air conditioning has increased its volume of business approximately 30 per cent.

"For an office in a typical building already erected, the installation cost will average about 47 cents per sq. ft. of office space, and the operating cost about 10 cents per sq. ft.

"Single offices can be conditioned for an installation cost of from \$500 to \$800 with an operating cost of from 4 cents to 6 cents per hour of actual use.

Estimated Cost for Home

"In the home, a seven-room house can be completely air conditioned at a cost of approximately \$3,000. This provides summer cooling, air circulation, air filtering, adequate fresh air make-up, and all necessary functions for a summer comfort job, and in addition, the system operates in winter to add moisture to the otherwise dry atmosphere and to provide a positive and accurate control of fresh air make-up and air circulation.

"On our very low domestic rate, the electric service cost for operating this system will only cost 50 cents per day during the summer.

"Yes, we may say that the installation of an air-conditioning system is equivalent to driving a young Cadillac into the front door of our customers' homes.

Compared to Automobile

"This is partially true on first thought. The value of the automobile within two years will be approximately \$700, whereas the air-conditioning system, if properly designed and installed, will be as useful and as modern in so far as appearance and utility are concerned the last day it operates as it was when it was first installed.

"In your home, a permanent fixture such as air conditioning is not subjected to progressive obsolescence. Think of the difference in operating cost of an automobile and the air-conditioning system.

For the Price of a Movie

"A still better analogy of the unusual value received in the application of our services to air conditioning is that for the cost of a two hours entertainment in the average picture house, you may make your entire family as comfortable in your home for the entire day.

"Air conditioning, and especially our electric service application to it, is most interesting and economical to utility customers. Above everything else, we should inform ourselves about the true value of air conditioning, and never dismiss an inquiry with the suggestion that air conditioning is in any sense experimental if properly applied.

"As to the extent to which air conditioning has already been applied in Alabama, the installations in Alabama represent an investment of approximately \$350,000, and employ a connected motor load of 1,500 hp."

Willis Carrier Addresses Alabama Engineers on Air Conditioning

BIRMINGHAM, Ala.—Willis H. Carrier, chairman of the board of the Carrier Corp., and a pioneer in the air-conditioning field, addressed some 300 engineers, architects, contractors, and dealers at a recent meeting of the Birmingham branch of the American Society of Mechanical Engineers.

Mr. Carrier stated that theaters and large department stores installed air conditioning as a necessity and found it a paying investment. He said that people would not attend theaters in the summer time before they were air conditioned but that now more people attend in the summer than in the winter.

In some of the larger department stores in pre-air-conditioning days, conditions were almost unbearable during the summer time and women often fainted due to overcrowding, but now they do more business in summer than in winter owing to the comfort of air cooling.

He was introduced by John A. Sirnit, chairman of the Birmingham society.

Gar Wood Makes Larger Burner Unit

DETROIT — Gar Wood Industries, Inc. is now manufacturing a larger-sized Model R boiler unit, reports Stanley E. Chase, of the air-conditioning division of the Gar Wood organization.

Capacity of the new unit is 750 sq. ft. of net steam radiation. The original unit has also been redesigned and its capacity increased from 450 to 475 sq. ft.

Cheetham Will Direct Starr Sales in South

BIRMINGHAM, Ala.—E. B. Cheetham has been appointed general sales director for the southern states for the commercial refrigeration department of the Starr Co. of Richmond, Ind.

He will make his headquarters in Birmingham.

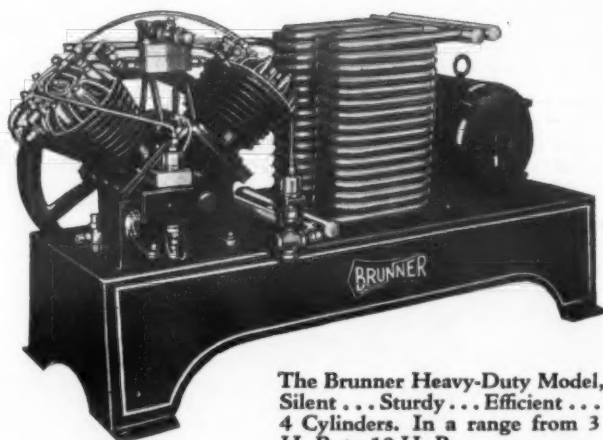
Mr. Cheetham was formerly connected with the commercial division of Kelvinator Corp.; was director of sales for the Gibson Refrigeration Corp. of Greenville, Mich.; and at one time was with the Kold-Hold Mfg. Co. of Lansing, Mich.

Beauty Parlor Owners Hear Air-Conditioning Story

NEW YORK CITY—John W. Mersfelder, specialist in the air-conditioning field, spoke on air conditioning applied to beauty parlors at a meeting for beauty parlor operators held under the auspices of the Electrical Association of New York, Inc., in the association's auditorium in Grand Central Palace recently.

Frigidaire Suit Against Fedders on Patent Is Dismissed

BUFFALO—The suit of Frigidaire Corp. vs. the Fedders Mfg. Co., Buffalo, charging infringement of commercial coil patents held by Frigidaire, has been dismissed by United States District Judge John Knight at the request of Frigidaire after Fedders discontinued manufacturing the type of equipment in litigation. The suit was filed in March, 1930.



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How to Repair Damaged Cabinet Parts and Finishes

CHICAGO—Methods for detecting and repairing faulty or worn-out refrigerator cabinet parts and finishes are described in lesson 24 of the refrigeration home study course prepared by the Refrigeration and Air Conditioning Institute located at 2130 Lawrence Ave., Chicago, Ill. The lesson reviews various kinds of cabinet construction, and types of insulation, and makes suggestions for repairing cabinet parts and finishes.

Cabinet Construction

The earliest mechanical refrigerators or electric refrigerators consisted of condensing units and cooling units arranged for installation in the commonly used ice refrigerator cabinets, the cooling unit being placed in the ice chamber and the condensing unit located at some convenient place outside the refrigerator—the arrangement which at present would be called remote installation.

Using ice refrigerator cabinets constructed mainly of wood with but a small amount of metal sheathing was not very successful. The wood framework would not withstand the condensation of moisture and the expansion and contraction which were so much greater with mechanical refrigeration than with ice refrigeration. The joints would eventually loosen and come apart to ruin the cabinet.

Also, only a relatively few of the older ice refrigerators have sufficient heat insulation. Such a great quantity of heat units leaked in through the walls of the food compartment and ice chamber that any refrigerating apparatus installed was badly overloaded and was unable to furnish really satisfactory cooling except at considerable expense for electric power.

Three Types of Design

Cabinets built especially for mechanical refrigerators have followed three principal designs. Some of them are built up with a complete wood framework or skeleton to which are attached metal plates for the outside and other metal plates to form the food chamber. Heat insulating material is placed between outer and inner plates.

Other cabinets consist of a metal

outer shell welded and formed into one piece of metal, a second one-piece metal shell forming the food chamber, a wood frame joining these two shells at the door opening or openings and a wood framework around the bottom to brace the whole structure and allow attachment of the legs. The heat insulating material is between the two shells, as with all other constructions. Fig. 1 shows a refrigerator cabinet employing a hardwood frame for the main structural support. This illustration shows also the details of how the insulation is located and many other features which are found in modern cabinets.

Still other refrigerators use all-steel cabinets with no wood framework at all. The inner and outer shells are welded into a one-piece construction and the insulation is forced in between them. A liner consisting of wide strips of bakelite or similar material is attached to the outer shell around the door and other openings and the inner shell is fastened to this liner.

Heat Insulation

The efficient and satisfactory performance of a refrigerator depends greatly on our success in preventing the flow of heat units from the surrounding air space into the food chamber. To keep such heat flow, the space between the inner and outer walls is filled with some kind of heat insulating material.

The effectiveness of the insulation depends on the quality or excellence of the material and on its thickness. It is customary to employ a two or three inch thickness, sometimes using more at certain points than others, again having a uniform thickness all around the food chamber. All other things being equal, the greater the thickness of insulating material the less heat will filter through and re-

quire removal by the refrigerating apparatus.

The effectiveness of any heat insulator depends also on the absence of moisture from the material. Were we to consider the insulating ability of typical materials as 100 per cent with no water moisture present, this ability would be reduced to about 85 per cent of the original value were the amount of moisture equal in weight to one-half the weight of the insulating material.

If the moisture were increased so that its weight equalled the original weight of the dry material, the heat insulating ability would be reduced to about 70 per cent.

Thus, a three-inch thickness of insulator which contains moisture equal to its own weight is no better than a thickness of only a little more than two inches of the same material when perfectly dry.

It is not difficult to obtain perfectly dry insulation to begin with, but then it is necessary to prevent the entrance of moisture. You know how readily tiny drops of water collect on the outside of a cold object in ordinary summer weather, so you can imagine how readily moisture will enter and condense within heat insulating material which is not thoroughly protected.

Refrigerator insulation is sealed against moisture by dipping it into hot asphalt compounds of one kind or another, also by wrapping the sheets or blocks of material in waterproof paper well sealed at all the joints. After sealed packages of insulation are installed between the refrigerator walls it is customary to seal over all the exposed surfaces to make doubly sure of freedom from moisture.

Kinds of Insulating Materials

A great many different kinds of heat insulating materials are used in modern refrigerators. All of them depend for their effectiveness on the formation of millions of extremely small air spaces within the solid parts of the substance. Each tiny air chamber must be completely sealed off from all the others so that it is impossible for air to pass through from one point to another in the mass.

Air which is not in motion or air which is allowed to move only within an extremely small distance is an excellent heat insulator. But if the air is in comparatively large bodies so that there may be currents or streams of air moving from place to place within a space, the air is not at all effective as an insulator.

The fact that air in motion is no insulator is proven by the fact that we use currents of moving air to pick up heat from the foods stored in a refrigerator and to carry this heat to the evaporator where the heat units leave the air.

Moving air effects a continual transfer of heat from warm bodies to cooler ones it may reach. Thus, were the space between the shells of a refrigerator cabinet filled only with air allowed to circulate freely within this space, heat would be continually picked up from the warm outer shell and carried over to the cold inner shell, after which the air would return to the outer wall for more heat and keep up the process.

The more closely we confine the air, or the less room we allow in which each minute body of air may move, the more effective will be the insulating ability. This statement is correct for all practical purposes when dealing with common insulating materials, but there is a limit of "smallness" of the air spaces beyond which the insulating ability would again fall off as the solid walls of the air cells come too close to one another.

Following are some of the insulating materials used in refrigerator construction: Corkboard, or finely divided bark from the cork tree compressed with a binder into slabs or sheets of various thicknesses. Granulated cork or ground cork, not compressed, is not so effective as an insulator. Rock cork, so-called, consists of fibres of limestone and is not really cork. Mineral wool is made from fibres of slag, but balsam wool is fibres of wood. Expanded wood fibre is called Masonite, while pressed wood pulp is called Insulite. Vegetable fibres of cane, grass and other varieties, made into rigid sheets, into felts, into sheets between paper and other forms are used to make kapok or Dry Zero, Linofelt, Fibrofelt, Flaxlinum, Celotex, and Cabot's quilt.

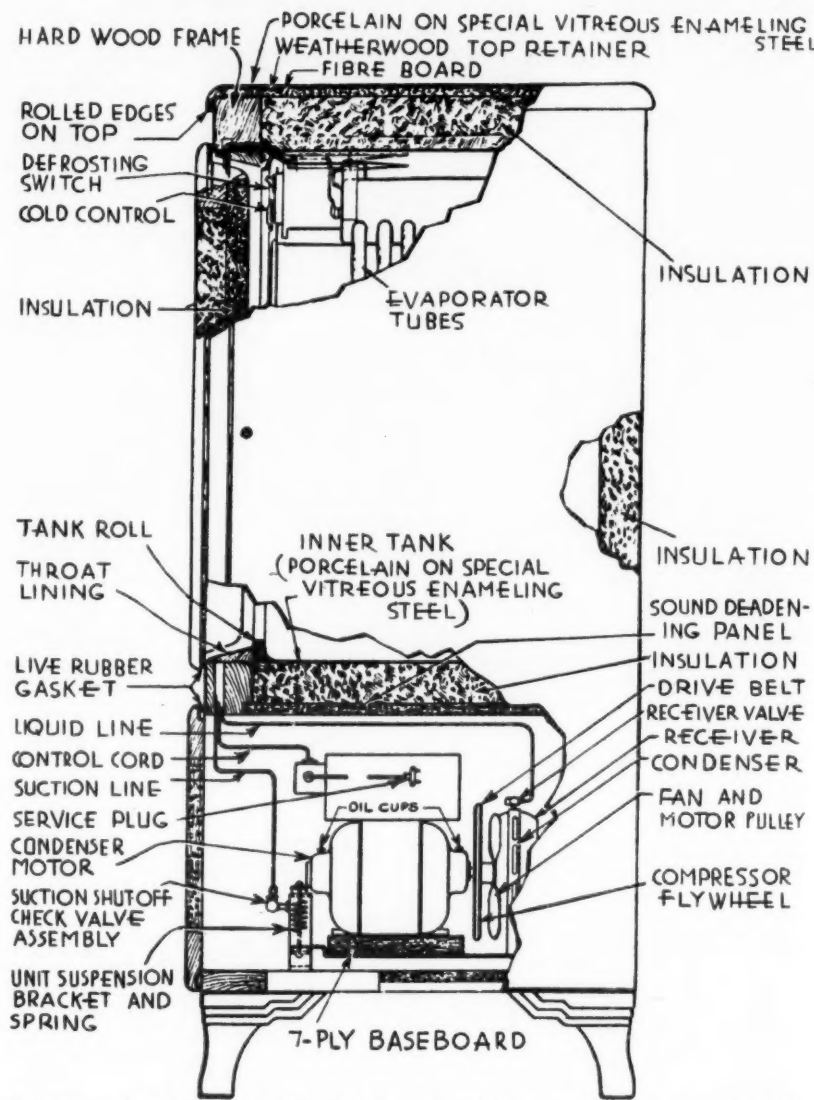
Measurement of Insulating Ability

The heat insulating ability of any material is measured in a very definite standard. This standard is the number of B.t.u.'s which will pass in one hour through one square foot of material one inch thick when the temperature difference on opposite sides is one degree Fahrenheit.

If the temperature difference is more than one degree, as is usually the case, we multiply the leakage for one degree by the number of degrees actually existing. If the thickness is more than one inch, as is usual, the leakage is divided by the number of inches because the greater the thickness the less the leakage.

The value per inch thickness, per degree temperature difference as or-

Cabinet Construction Details



Cutaway drawing showing details of cabinet construction and parts in typical, modern household electric refrigerator.

iginally arrived at is called the heat conductivity constant. For materials generally used in refrigerator cabinets this constant runs between 0.24 and 0.27, averaging something like 0.26.

Were we to consider a refrigerator cabinet having a total inside area of 28 square feet and with a three-inch thickness of insulation between the walls, and were the inside temperature 45 degrees and the outside room temperature 75 degrees, or a 30 degree temperature difference, the leakage for commonly used insulating materials would be between 72 and 75 B.t.u.'s per hour.

Now let's see what would happen to our refrigerator were we to use materials not so effective as those generally employed by the manufacturers.

Either sawdust or corrugated asbestos in the 3-inch space would increase the leakage to 162 B.t.u.'s per hour. If we used solid wood laid so the heat would travel across the grain, giving the highest resistance, we would have a leakage of 308 B.t.u.'s with maple and 406 B.t.u.'s with oak. Filling the space with sand would jump the heat loss to 672 B.t.u.'s per hour.

If you poured water in between the shells the leakage would rise to 1,140 B.t.u.'s, and if you were foolish enough to make the walls of solid wrought iron three inches thick you would find a heat flow of 117,000 B.t.u.'s per hour. This shows how necessary it is to prevent any metal parts from contacting both the inner and outer shells of a refrigerator because there would be a leakage through 9/10 square inch of iron as great as through one square foot of regular insulating material.

The Importance of Air Circulation

While heat insulation depends largely on preventing air circulation between the inner and outer shells, the overall performance of efficiency of the refrigerator depends on our maintaining free circulation of air within the food compartment and through the condensing unit compartment. These circulations are illustrated in Fig. 2.

Circulation of air within the food chamber is depended upon to pick up heat from the foods and carry the heat to the evaporator or cooling unit. Circulation through the condensing unit space is depended upon to remove heat from the condenser and carry it away into the surrounding air in an air-cooled system. Neither circulation may be restricted without losing refrigerating ability.

You will notice in all refrigerators that the evaporator or cooling tank is enclosed by partitions called baffles which force the warmed air from the foods to enter at the top, pass down through and around the evaporator, out the bottom of the enclosure, and back to the food space after losing heat to the cooling unit. The space around the evaporator must be large enough to let plenty of air circulate, yet not so large as to allow small "eddy" currents of air to whirl around inside baffles instead of passing straight through from top to bottom.

Excessive frost on the evaporator unit may so restrict the air passages as to prevent satisfactory refrigeration. If the top of the evaporator or cooling unit sticks up above the edge of the surrounding baffles, the warm air will enter the evaporator at a point below this top portion and the upper part of the cooling unit will take little or no part in the cooling.

It is highly important that you always replace all the baffles and that you replace them in the exact original positions where they are located by the manufacturer.

Circulation within the food chamber sometimes is restricted by the user placing papers or cloths over the shelf surface or by crowding dishes so closely together that the full circulation of air cannot take place. All modern refrigerators are designed to work efficiently and well when operated correctly, but when there is interference with normal air currents the refrigeration will suffer.

Door Gaskets

To insure that there be no leakage of air into or out of the food compartment while the doors are closed, the edges of the doors are fitted with gaskets of rubber, of impregnated fabric or other heavy and springy material. In time these gaskets will wear out or lose their springiness and will have to be replaced. They will last a long while if kept clean and free from greases and oils which attack and ruin rubber in any form.

The fit of a gasket may be tested very easily by holding a strip of paper across the edge of the opening and closing the door on the paper. If the paper pulls out very easily it indicates that the gasket is not making a tight fit, while if the paper can be pulled through with difficulty or not at all the gasket fits at that point. Several points should be checked in this manner.

Cabinet Finishes

The exposed surface of the outer shell and the inside of the inner shell forming the food compartment are (Concluded on Page 19, Column 1)

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Methods of Repairing Damaged Finishes On Household Refrigerator Cabinets

(Concluded from Page 18, Column 5)

coated either with lacquer, with porcelain, or partly with one and partly with the other. Oftentimes the interior is porcelain and the outside lacquered, or at least the bottom of the food compartment is porcelain coated.

Lacquer is a varnish-like material containing colors or pigments and capable of taking a very high polish. Porcelain is a highly glazed china-like material which has many of the qualities of glass and must be treated with care to avoid cracking or chipping.

Metal to be lacquered is washed and dried with heat, then coated with a primer which seals the metal pores and makes a smooth base for the following finish. This primer is baked onto the metal. The surface then is wet with water, sandpapered while wet, and then thoroughly dried. Several coats of lacquer are then sprayed onto the surface, each being dried with moderate heat before the next is applied.

For enameling with porcelain the metal is pickled to remove the scale after being welded to form and the shells then are dipped bodily into a bath of the porcelain material which is about the thickness of ordinary paint. The excess is drained off and the parts are dried with moderate heat.

Parts, such as corners, which are subject to extra strains are given an extra thickness of this ground coat and the material is hardened in ovens at a heat of 1,500°. Then the finishing coats of porcelain are applied and the corners and other strain bearing parts are wiped to reduce the thickness of these coats. The exterior finishing coats are baked or fused in place under the same high heat of 1,500°.

Cleaning the Parts

Refrigerator surfaces, especially the interiors of food chambers should be thoroughly cleaned at regular intervals, preferably just after the defrosting operations. If defrosting is done only at long intervals, the cleaning will have to be done also between times.

Lacquer finishes are cleaned with good pure soap such as Ivory, in warm water or with powdered Bon-Ami and warm water, then washed with clean water and dried with a clean, soft cloth.

Most lacquers do not require any additional polishing, and the use of furniture polishes may cause staining or yellowness in time. Others may be polished to advantage with any high grade furniture polish or wax. If these polishes become too thick they may be removed with naphtha.

Porcelain finishes, outside and inside, may be cleaned with a half teaspoonful of soda in a quart of lukewarm water. The outside of porcelain cabinets may also be cleaned with powdered Bon-Ami or with ammonia in water. The cleaning agents should be washed away with clear water and the surfaces dried with clean cloths.

Porcelain which has been stained with sulphur dioxide may be cleaned by brushing on some hydrochloric acid or using concentrated oxalic acid in the same way, then rinsing with clear water. You can repeat the acid applications until the original color returns. Keep these acids away from your hands. The best way is to use rubber gloves during the job.

Metal trays and shelves which are tinned on the surface may be cleaned by dipping them in a solution of ½ lb. of lye dissolved in a gallon of water. Have this bath in a crock of 3-gal. size or larger. Let the pieces stay in the lye water about 15 minutes after bubbles commence to form. If the coating is very bad you can brush the metal while in the lye. Then lift the pieces out of the lye with rubber gloves or tongs and rinse them in running water. Next, dip the parts in vinegar for about 10 minutes to neutralize the lye which is an alkali, and again rinse in running water.

Aluminum trays and shelves which have become corroded and blackened may be cleaned in an acid solution made up of 100 parts of water, 10 parts of sulphuric acid, and 1 part of hydrofluoric acid, all measured by volume.

Make this mixture in the open air, keeping it in an earthen crock well coated with paraffin wax, and use rubber gloves while doing the mixing and the cleaning job. The acids are very harmful to your skin, and the fumes of the hydrofluoric are very dangerous to your lungs. Dip the aluminum parts in the acid bath for a few minutes, then take them out and rinse them well with running water. You can repeat this several times if necessary to remove the discoloration.

Repairing Damages to Lacquer

The method of correcting damages to surfaces finished with lacquer depends on the extent of the trouble. Small nicks, scratches, and pin holes which do not extend all the way

through to the metal underneath may be easily handled with no more equipment than a camel hair brush and the necessary finishing materials.

If the damage goes through to the bare metal, more extensive work will be needed. If the damaged spot is large, or if there has been considerable rusting it is usually necessary to refinish a whole panel or door or even the entire cabinet.

How Lacquer is Applied

Small scratches and chips can be corrected with a small brush, a number 2 pencil brush of camel hair being about right. Lacquer applied with a brush usually is thinned with a little bit of lacquer thinner, not more than one-tenth thinner to nine-tenths lacquer. When working with a brush it is best to take only a little of the material on the brush at a time, applying many thin coats with even strokes in order to avoid runs of the liquid.

The larger the size of the repair to be made the less satisfactory the brush becomes and the more necessary it becomes to use regular spray painting equipment. The spray gun consists of a nozzle through which compressed air is allowed to flow, of a trigger-controlled valve for admitting lacquer or other fluids to the nozzle, and of a cup or can attached to the gun and holding the supply of liquid. The nozzle has changeable caps, one of which produces a round spray and the other a flat, fan-shaped spray.

Compressed air may be furnished by a small belt-driven compressor and an electric motor, or where compressed air is already available in a shop the outfit may be had without the compressor equipment. A pressure of about 20 lbs. per inch is used with the small outfits. Air hose and connections from 15 to 25 ft. long connect the compressor or supply line to the spray gun. Many outfits, especially those used on other sources of compressed air, are equipped with a separator for removing moisture from the air.

The round or pencil point nozzle is used for small areas and the flat nozzle for large ones. There is an adjustment for the width of the spray and the amount of liquid admitted through the valve. A medium width or medium-narrow width of spray is best for refrigerator work. When very small spots are to be treated the spray should be cut down quite small. The spray must be adjusted to the proper volume and width before you point the gun at the surface to be covered.

The gun is handled as though the spray were a brush being drawn across the surfaces. When you are covering a large surface use long, even strokes and release the trigger at the end of each stroke. Don't point the gun at the surface being covered after the trigger is released because the blast of air may cause wrinkles to form.

With the low-pressure guns employed for this class of work the nozzle should be held about 10 in. from the surface. If it is too close the lacquer will run, while if held too far away the material will commence to harden before it hits the surface and the appearance will be dull and dusty.

When you work on only a small spot within a panel there will be a dusty area around where you work, this being due to lacquer escaping from the edges of the spray. After the job is finished this dusty area can be made smooth by spraying a very thin coat of lacquer thinner over the whole area, having the adjustment set so that the surface is barely dampened with the thinner.

A coat of lacquer is applied by first setting the nozzle in position to produce a vertical spray and working with horizontal strokes, then setting the nozzle for a horizontal spray and working with vertical or up-and-down strokes. This makes a criss-cross coat.

When you are working on a small spot, operate the trigger to produce small spurts of the spray. In all lacquering it is essential to have plenty of good strong light on the surface you are covering.

When you have laid the spray gun aside for a few minutes during the job some of the lacquer will dry at the nozzle. Before starting in again, draw the edge of a piece of paper or a cardboard through the slot or use your fingernail to remove the dried material. It is necessary to keep a spray gun clean if it is to be depended upon for good work. When you are through with a job, put a little thinner in the can and spray it through the nozzle. Then carefully wipe all the outside parts with thinner on a brush or a cloth.

The lacquer used in a spray gun must be considerably thinner than that used with a brush, so the liquid placed in the can of the spray gun is made up of about half lacquer and half lacquer thinner or lacquer reducer. It is best to obtain lacquer from the maker of the refrigerator,

or to obtain that which the maker recommends, or at least to use a grade designed for this work. Automotive lacquers are not suitable.

The reason for getting lacquer from the refrigerator maker is so you can depend on a color match. You can't even depend on white when obtained otherwise, because a really white lacquer would appear cream colored to most people, and it is mixed with a small quantity of blue or green to get the desired effect.

If you want to learn how to use a spray gun with lacquer you either may experiment on some old panels until you are able to get the right effect, you may watch someone else in the shop who has had experience, or you may go to any first class automobile shop and see how competent men handle the guns. The work is easy after you do a few jobs.

If a lacquer doesn't match the remainder in color it is best to remove all grease, dirt, wax, and polishes from the whole cabinet by using very fine sandpaper, then wiping the surface with naphtha on a cloth. Then spray one coat of your own color of lacquer over the whole job. If white lacquer has become yellow with age or from application of improper polishes and cleaners, remove the surface film with the fine sandpaper and naphtha, then spray on a thin coat of lacquer or thinner, and follow it with a coat of finishing lacquer put on criss-cross.

A Lacquer Touchup Job

If the undercoat of lacquer or primer remains intact, begin the work by thoroughly cleaning the damaged spot with naphtha on a cloth. Then fill the spot with lacquer applied with the pencil point camel hair brush, putting on two or three coats so the added material extends slightly above the surrounding surface after it dries. Apply lacquer just to the edge of the damage, not over onto the good part of the finish. Let this part of the

work dry for an hour or more.

Now dress the job down with 8-0 (eight-0) wet-or-dry sandpaper or equivalent material which is well wet with water or with naphtha. If the surface is flat, wrap the paper around a small square block of wood. If the surface is curved place the paper over the flat of two fingers. Rub in a straight line, in only one direction, and just enough to get the new surface level with the old. Work very slowly and carefully so that you don't rub through and have an even bigger job to handle.

To polish the job rub it hard and fast with a damp cloth sprinkled with powdered Bon-Ami. You may have to clean the whole cabinet surface with the Bon-Ami to get an even appearance. Finally, wipe the surface with a soft cloth just dampened with naphtha.

The Lacquering Outfit

If you intend to make lacquer patches or complete refinishing jobs there is a certain amount of equipment needed in addition to the spray gun outfit. This equipment should include a number 2 pencil brush of camel hair, an ox hair brush about 1½ in. wide, and a medium bristle wire brush. Then you will need some glazing putty and a flexible glazing knife with a blade ¾-in. wide. For rubbing down you will want 5-0 and 8-0 wet-or-dry sandpaper or its equivalent in grade and some 150-mesh emery cloth. The kind of lacquer depends on the finish already on the refrigerator, since it should match.

Among other finishing and cleaning liquids should be some cleaner's naphtha, some lacquer reducer or thinner, some air drying primer for metal, and also some rust preventative material. For polishing, and also for cleaning, you will require powdered Bon-Ami (not the cake variety), some hard rubbing and polishing compound, and a supply of clean cloths. Small chips and cracks in porcelain

finish can be satisfactorily repaired in the field or the service shop, but complete refinishing or complete panels require more extensive facilities than ordinarily are available and it is best to replace the damaged sections with new ones.

Before commencing these repairs, have the machine thoroughly dried and warmed to room temperature, since the work won't be successful if there is condensed moisture present. Clean the damaged spot and all around it with gasoline or naphtha and remove any remaining loose chips with a blunt tool so that they won't dislodge and cause trouble later on.

Now fill the patch with porcelain putty until it is raised even with the surrounding surface or slightly above. Use your putty knife or glazing knife for this work. The work also may be done by applying several thin coats, letting the putty dry about an hour between coats. The final coat must dry 10 to 12 hours. Now carefully sand the surface until it is smooth, true, and unbroken. Use a fine grained sandpaper wet with water. The final finish is given by polishing as when cleaning porcelain.

WE LEAD!

We are the leading school in the refrigeration field because we zealously maintain the highest possible standard of training for men desiring to enter the industry and those already a part of it. Our object is to render service to all in a way that will make the industry glad we are associated with it.

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DELCO MOTORS



ALL DELCO MOTORS HAVE DIAMOND BORED BEARINGS

To insure permanent quietness, a motor must have not only well lubricated bearings but also bearings which are accurately machined. The bearing surface must be smooth and the machining must be accomplished so as not to injure the crystalline structure of the bearing material. Accurate clearances must be maintained. To accomplish these objectives it is necessary that the bearings be diamond-bored—which is standard practice on all Delco motors. It is largely due to this precision operation that Delco motors are so well known for their quietness and dependability, and so widely used by manufacturers of the better household appliances.

DELCO PRODUCTS CORP., DAYTON, OHIO
Made in Canada by the McKinnon Industries, Ltd., St. Catharines, Ont.



PATENTS

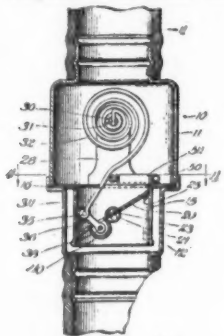
Issued Feb. 19, 1935

1,991,384. FRIGID OR FROZEN PRODUCT AND ITS PREPARATION. Crosby Field, Brooklyn, and Frank Short, Poughkeepsie, N. Y., assignors to Flakice Corp., Brooklyn, N. Y., a corporation of Delaware. Application Aug. 4, 1928. Serial No. 297,386. 17 Claims. (Cl. 62-92.)

1. A frozen product comprising nuclei of a frozen substance of a relatively low freezing point surrounded by a frozen substance of a relatively higher freezing point.

1,991,392. THERMOSTATIC VALVE. Peter J. Jorgensen and Clarence H. Jorgensen, Oak Park, Ill.; Clarence H. Jorgensen administrator of estate of said Peter J. Jorgensen, deceased. Application Nov. 21, 1931. Serial No. 576,526. 11 Claims. (Cl. 236-34.)

1. A temperature responsive control system comprising a movable valve, a temperature responsive element having one



1,991,392

end connected with the valve to move the same in response to temperature changes, yielding means fixing the other end of said element, and a shiftable abutment limiting the movement of said yielding means in one direction, said shiftable abutment being adjustable without disturbing the relation between said end of the temperature responsive element and the valve.

1,991,434. THERMOSTATIC VALVE. Sidney P. Vaughn, United States Navy, Ackerman, Miss. Application May 19, 1933. Serial No. 671,879. 13 Claims. (Cl. 236-48.) (Granted under the act of March 3, 1933, as amended April 30, 1934; 370 O. G. 757.)

1. In a thermostatic device of the character described, the combination with a thermostatic element arranged to move according to temperature variations, and a valve or other element arranged to be operated thereby, a body member connected to said thermostatic element, a resilient lever pivoted at one end to said body member, a stiff lever pivoted at one end to the body member with its free end bearing against the pivoted end of the resilient lever and moving with the thermostatic element, and a snap spring normally concavo-convex transversely

throughout its length supported by its ends on shoulders on said body member and positioned so that the free end of the resilient lever bears against the convex side thereof, said valve being disposed so as to be operated by the concave side of the snap spring.

1,991,465. REFRIGERATION PROCESS. Ernest B. Miller and Gerald C. Connolly, Baltimore, Md., assignors, by mesne assignments, to Chester F. Hockley, receiver for The Silica Gel Corp., Baltimore, Md., a corporation of Maryland. No Drawing. Application June 9, 1931. Serial No. 543,240. 10 Claims. (Cl. 62-179.)

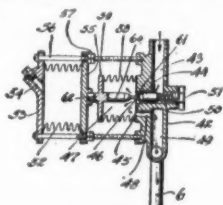
1. A method of refrigeration consisting in evaporating liquid amo and adsorbing the gaseous amo, in a solid, porous adsorbent material having the moisture content reduced to a point not exceeding 5 per cent of its dry weight.

1,991,495. THERMOSTATIC ELEMENT. Norman L. Derby, New York, N. Y. Application Nov. 1, 1930. Serial No. 492,707. 13 Claims. (Cl. 297-15.)

2. A thermostatic element of uniform thickness comprising a continuous piece of recessed metal and inserts of another metal permanently united to the walls of and completely filling the recesses in said first mentioned metal, the two metals having different coefficients of expansion.

1,991,514. ARTIFICIAL REFRIGERATING APPARATUS. Earl P. Oswald, Detroit, Mich., assignor of one-tenth to Charles E. Wisner, Detroit, Mich. Application Dec. 7, 1928. Serial No. 324,342. 1 Claim. (Cl. 236-92.)

An expansion valve providing for restricted flow from the condenser to the expansion coil of an artificial refrigerat-



1,991,514

ing system of the compressor-condenser-expander type, said expansion valve comprising a chambered member open to flow from the condenser, a valve member therein and a port opening through the face of the member, an expandible bellows member secured to the member providing a chamber open to the port, said bellows member having a closed end opposite the port including a stem projecting externally thereof, and an internally projecting stem having a portion extending through the port to engagement with the valve, a spring tending to force the valve towards its seat and against the said stem, a conduit opening to the interior of the bellows member and to the expansion coil whereby the position of the valve is effected by the pressure of the refrigerant, a second bellows member supported in longitudinal alignment with the first bellows member and providing a sealed chamber filled with a temperature sensitive fluid, one end of the second bellows member being anchored and the other of which is movable, adjustable means for limiting the extent of movement of the said movable end of the sec-

ond bellows member by pressure there-within, said second bellows member, being directly subject to temperature change in the space being refrigerated, the outwardly extending stem of the first bellows member being socketed in the said movable end of the second bellows member whereby the expansion of the second bellows member tends to contract the first bellows member and by means of the inwardly projecting stem to hold the valve from its seat to a varied degree depending upon the variation in position of the movable end of the second bellows member.

1,991,581. AIR COOLING APPARATUS. Frederick L. Shelor, Richmond, Va., assignor to S. and S. Engineering Co., Richmond, Va., a corporation of Virginia. Application Jan. 18, 1933. Serial No. 652,388. 3 Claims. (Cl. 261-107.)

1. An air cooler including in combination a standard, a receptacle mounted thereon, said receptacle having a partition forming an annular chamber for retaining water, bracket arms carried by the receptacle and projecting above the same, a cylindrical fabric member supported by said bracket members and extending into the receptacle beneath the water level, a cover for said receptacle contacting with said fabric at the upper edge thereof, an impeller within the receptacle movable about a vertical axis and having radial air passages therein, said cover having an air inlet whereby air is directed into the center of the impeller and forcibly ejected therefrom against the fabric along the surface of the fabric and through the fabric.

1,991,631. HEAT EXCHANGER. William Sangster, Peterborough, Ontario, Canada, assignor to The De Laval Separator Co., New York, N. Y., a corporation of New Jersey. Application Jan. 18, 1933. Serial No. 652,309. 4 Claims. (Cl. 257-183.)

2. A heat exchanger including tubular headers having lateral openings therein, tubes joining the headers and extending through said openings into the headers, and means for restricting communication within the headers between pairs of tubes while providing free communication between members of each pair, said means including bevelled ends of certain tubes within the headers lying closely adjacent the inside walls of the headers, said bevelled ends being spaced from the inside walls of the headers to provide for a restricted flow through the length of each header for the removal of sediment.

1,991,641. CABINET WATER COOLER. Carter F. Truitt, San Diego, Calif. Application July 10, 1933. Serial No. 679,725. 2 Claims. (Cl. 62-154.)

1. In a cabinet water cooler, a shell member open at its upper end, a cover for the upper end thereof having a centrally disposed aperture therein, a supporting ring member bordering said aperture at the upper extremity of said shell and arranged to engage and support a liquid reservoir, a receptacle support secured in said receptacle to the inside of the walls thereof near its middle portion, a receptacle adapted to rest upon and extending into contiguous relation to the margins of the aperture in the cover so as to receive liquid from said liquid reservoir, a faucet extending from the receptacle through a wall of the water receptacle, a basin fixture mounted below the faucet, a drain cock fixture mounted below the basin fixture, said fixtures including tubular securing elements protruding through the wall of the shell member, and a waste collecting vessel mounted wholly within the shell member and secured thereto by means of said securing elements whereby water from the basin drains therein and the drain cock forms an outlet therefor.

1,991,659. CONTROL FOR FANS, BLOWERS, AND PUMPS. Thomas Bosanko Collins, Strathbungo, Glasgow, Scotland. Application June 12, 1932. Serial No. 675,499. In Great Britain July 7, 1932. 8 Claims. (Cl. 230-114.)

1. Means for controlling the volumetric output and discharge pressure of a fluid machine having an eye, comprising an inlet casing facing the eye of the machine and having two stationary walls of diametrically opposite sides around portions of the said eye, two entrance chambers at diametrically opposite sides of the said inlet casing, means for varying the throat between the said inlet casing and two entrance chambers, the said means comprising for each entrance chamber two curved plates which are hinged together, the one plate forming a wall of the entrance chamber and the other plate a portion of the wall of the inlet casing, the non-hinged end of the latter plate being movable along one of the said stationary walls of the inlet casing and the hinged end thereof being movable around a portion of the said eye which is not surrounded by the said stationary wall, and means for connecting the pair of plates of one entrance chamber with the pair of plates of the other entrance chamber so as to enable them to be operated simultaneously.

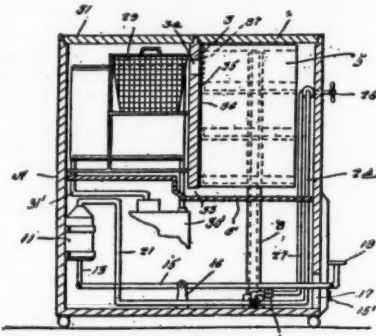
1,991,660. CONTROL OF FANS, BLOWERS, AND PUMPS. Thomas Bosanko Collins, Glasgow, Scotland. Application June 14, 1933. Serial No. 675,832. 2 Claims. (Cl. 230-114.)

1. Means for controlling the volumetric output and discharge pressure of a fluid machine having an eye, comprising a single intake of rectangular cross section in combination with a cylindrical inlet casing surrounding and concentric with the eye of the machine, half of said cylindrical casing consisting of a stationary part terminating said intake, the other half of the casing being longer than the diameter of the latter and adapted to move along the stationary part and form a throat of variable size in said cylindrical casing for the admission of fluid, and a plate lying in said intake outside the inlet casing and hinged to the movable part of said casing adjacent the throat, and means for moving said movable part of the casing.

1,991,661. REFRIGERATOR ARRANGEMENT. Carl H. B. Conley, Methuen, Mass. Application July 17, 1934. Serial No. 735,701. 2 Claims. (Cl. 62-34.)

1. A refrigerator having an opening at its top, a cover member for closing the opening, a shelf structure depending

from the cover member, pistons depending from the cover member, cylinders located in the refrigerator and receiving the pistons, a cylinder containing fluid, a piston therein, a pedal device extending through



1,991,661

the front of the refrigerator for raising the piston last mentioned, conduits connecting the last mentioned cylinder with the lower ends of the first-mentioned cylinders, a reservoir connected to the fluid cylinder, check valves in the conduits for retaining the fluid in the first-mentioned cylinders, a manually operated valve, and conduits connecting the same to the lower ends of the first-mentioned cylinders and with the second-mentioned cylinder.

1,991,680. THERMOSTATIC CONTROL SYSTEM. David J. Jones, Elmhuurst, Ill., assignor to Holland Furnace Co., Holland, Mich., a corporation of Michigan. Application March 2, 1931. Serial No. 519,472. 9 Claims. (Cl. 236-11.)

1. The combination with a furnace having means for supplying heated air, means for controlling the heated air supplied and means for artificially circulating the available heated air developed by the furnace of temperature responsive means effected by the temperature of said available heated air developed acting to control the operation of said supplied heated air control means and said circulating means whereby the supplied heated air will be increased or decreased when the temperature of the available heated air developed is below or above a predetermined degree respectively and to cause or cease operation of said circulating means when the temperature of said available heated air is above or below said predetermined degree respectively.

1,991,702. DEVICE AND METHOD FOR TREATING REFRIGERATORS. Truman Sunderland Safford, Harrison, N. Y. Application Aug. 7, 1931. Serial No. 555,739. 12 Claims. (Cl. 62-103.)

8. A non-frosting cooling unit comprising a cold heat-exchange member having its top surface so broad as alone to hold a layer of solid water-soluble anti-freeze material and a layer of water-soluble anti-freeze material exposed on said top surface in heat-exchange relation thereto and in the path of moisture-laden air currents which pass over said member so that moisture will be condensed thereupon from said air currents, whereby said water-soluble material will be dissolved to form an anti-freeze solution.

1,991,740. REFRIGERATOR CAR. Horace Giddings, San Francisco, Calif. Application July 26, 1932. Serial No. 624,733. 4 Claims. (Cl. 62-69.)

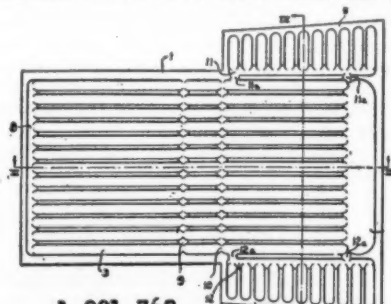
1. In a refrigerator car having an ice compartment and a cargo compartment, an ice tank in said ice compartment, the walls of said ice tank being formed of perforated metal plates, the perforations thereof having less width than height and the metal from said perforations remaining attached to the plates at the bottoms of the perforations and being bent outwardly to form tongues sloping upwardly from said perforations.

1,991,741. PRECOOLING APPARATUS FOR REFRIGERATOR CARS. Horace Giddings, San Francisco, Calif. Application June 27, 1933. Serial No. 677,837. 5 Claims. (Cl. 62-24.)

1. In a refrigerator car having a lading compartment and a refrigerating compartment at each end thereof; housings permanently mounted in the end regions of the car, the housing at one end being near the top and the housing at the other end being near the bottom, and said housings having openings to provide air passages between said refrigerating and lading compartments; and movable power driven fans mounted in said housings to force air through said passages.

1,991,762. REFRIGERATION APPARATUS. George A. Leyner, Springfield, Mass., assignor to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a corporation of Pennsylvania. Application April 5, 1934. Serial No. 719,102. 7 Claims. (Cl. 62-126.)

1. A refrigerant containing evaporator for a mechanical refrigerator comprising adjacent nested sheet metal walls, one of



1,991,762

which is provided with corrugations, said walls being welded together at their meeting edges and between the corrugations, whereby refrigerant passages are formed therein, inlet means for conveying refrigerant to the passages, outlet means for conveying vaporized refrigerant from all the passages, said walls being bent to form a five-sided freezing compartment having an open access end, all of the sides of said freezing compartment containing refrigerant.

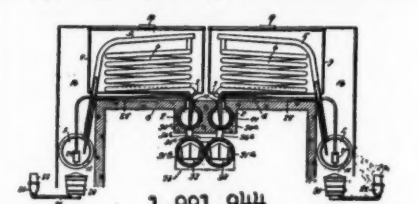
1,991,897. HEATING AND COOLING APPARATUS. Darragh Loring Higgins, Dedham, Mass., assignor to B. F. Sturtevant Co., Boston, Mass., a corporation of

Massachusetts. Application April 28, 1932. Serial No. 607,911. 2 Claims. (Cl. 257-137.)

2. An air cooler comprising a rectangular outer housing, a substantially smaller rectangular inner housing placed within the front portion of said outer housing and in support therefrom, a plurality of horizontal cooling coils supported from said inner housing and arranged crosswise thereof, and a fan within the inner portion of said outer housing and supported therefrom for forcing air to be conditioned over said coils and between said inner and outer housings.

1,991,944. REFRIGERATING METHOD AND APPARATUS. David Forbes Keith, Cleveland Heights, Ohio, assignor to Perfection Stove Co., Cleveland, Ohio, a corporation of Ohio. Application October 29, 1928. Serial No. 315,621. 7 Claims. (Cl. 62-118.)

6. The method of producing refrigeration through the agency of a closed system comprising a plurality of condensers and



1,991,944

an evaporator, which consists in evaporating a liquid refrigerant in the evaporator and alternately and intermittently reducing the temperature of each condenser and then on the other condenser, both condensation and evaporation taking place at substantially the same pressure.

1,991,976. CONDITIONING UNIT. Walter L. Fleisher, New York, N. Y. Application Sept. 18, 1931. Serial No. 563,480. 4 Claims. (Cl. 261-15.)

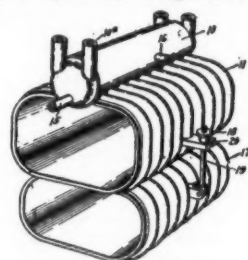
1. In a device of the character described, a conduit for conveying attenuating medium, a continuous helically wound extended surface of thin material capable of rapid heat conduction and integral with the conduit for aiding transfer of heat between the medium within the conduit and the atmosphere outside the conduit, the extended surface serving to collect and feed condensate to a depository in combination therewith, the extended surface causing thin surfaces of condensate to be produced thereon.

1,992,011. REFRIGERATOR CABINET. James L. Knight, Erie, Pa., assignor to General Electric Co., a corporation of New York. Application Feb. 4, 1933. Serial No. 655,245. 6 Claims. (Cl. 62-89.)

1. A refrigerator cabinet having a major portion of the outer surface thereof at substantially the temperature of the surrounding air and having another portion of said outer surface which may be cooled below the dew point of the surrounding air by transfer of heat to the interior of said cabinet, and means for transferring sufficient heat from a part of said major portion of said outer surface to said other portion to maintain the temperature of said other portion above the dew point of the air surrounding said cabinet.

1,992,018. REFRIGERATOR EVAPORATOR. Christian Steenstrup, Schenectady, N. Y., assignor to General Electric Co., a corporation of New York. Application Feb. 24, 1933. Serial No. 658,322. 7 Claims. (Cl. 62-95.)

7. A refrigerator cabinet, a cooling unit arranged in said cabinet, said cooling unit including a primary evaporator and a



1,992,018

hermetically sealed secondary evaporator partially filled with liquid refrigerant and removably secured to said primary evaporator in heat exchange relation therewith, said secondary evaporator having a compartment for receiving freezing trays.

1,992,051. AIR CONDITIONING APPARATUS. Samuel M. Anderson, Sharon, Mass., assignor to B. F. Sturtevant Co., Hyde Park, Mass., a corporation of Massachusetts. Application Jan. 13, 1933. Serial No. 651,519. 13 Claims. (Cl. 183-17.)

2. Air conditioning apparatus comprising a conditioning unit having sills of downwardly facing channel form, a collecting unit having upwardly facing channels with portions to overlap the sills of the conditioning unit, a filter in the conditioning unit, an apron on which the filter is supported and having a portion extending downwardly into the collecting unit, and means associated with the apron to prevent by-passing of air around the filter.

1,992,155. CONTROL DEVICE. Ernest J. Dillman, Detroit, Mich., assignor to Detroit, Mich., a corporation of Michigan. Application Dec. 12, 1930. Serial No. 501,927. 12 Claims. (Cl. 236-38.)

2. An apparatus of the character described, comprising a casing having a main inlet and an outlet and having an inlet aperture in a side wall of said casing and spaced from said main inlet, said casing having means positioned therein to vary the sensible heat of the air flowing through said casing, fan means operable to cause air flow through said casing and in contact with said means automatic means operable to control said fan means and responsive to the temperature of the air entering said aperture, and means responsive to the temperature of said heat varying means to control the operation of said control means, said last-named responsive means including means engageable with and operable to hold said control means against operation by said automatic means until said heat varying means attains a predetermined temperature.

A REFRIGERATION UNIT

is a Cooling Machine . . .

Beauty of finish and smartness of line add real sales value to any refrigeration unit, but its prime function is, and always has been, to refrigerate.

Engineers know that the cooling ability of a unit depends on these three inter-related factors of the refrigerating machine: design, construction and the refrigerant used. To get the low weight and compactness so desirable in modern automatic units, without sacrificing good operation, many manufacturers design their units to employ a refrigerant meeting these requirements:

- Low head pressures
- Pressure on low side above atmospheric at sub-zero temperatures
- Low piston displacement to produce a given refrigeration effect
- Relatively short time to produce a given refrigeration effect per unit volume
- Non-corrosive to ordinary materials of construction

ARTIC (Du Pont Methyl Chloride) meets these requirements. And as an added value ARTIC contributes toward efficient, trouble-free operation because of its favorable balance between volume of liquid circulated and latent heat, stability, simple lubrication, low power requirement and low tendency toward leakage.

Many manufacturers of automatic units have found that ARTIC definitely contributes to dependable performance. If you are considering the design of an automatic unit, we suggest that you review ARTIC's favorable combination of chemical, thermodynamic and other physical properties. Our 56-page book, "ARTIC—The Refrigerant," contains full technical information. If you do not have a copy, a request will bring one promptly.

Artic
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(DU PONT METHYL CHLORIDE)
IS A GOOD
REFRIGERANT

The R. & H. Chemicals Department
E. I. DU PONT DE NEMOURS & CO., INC.
Wilmington, Delaware

District Sales Offices: Baltimore, Boston, Charlotte, Chicago,
Cleveland, Kansas City, Newark, New York, Philadelphia,
Pittsburgh, San Francisco

ENGINEERING

McGovern Explains Method of Drying Methyl Chloride Systems

By E. W. McGovern, R. & H. Chemicals Dept.,
E. I. du Pont de Nemours & Co., Inc.

THE presence of moisture is undesirable in any refrigeration system with the exception, of course, of those in which water itself is used as the refrigerant. Although Methyl Chloride is recognized as being relatively non-corrosive to the common metals of construction in the presence of water, excessive amounts of moisture should be removed. Primary reason for removing

from a refrigeration system charged with Methyl Chloride is that such quantities of water as may be present above a few hundredths of one per cent will tend to separate as ice at the expansion valve and thus affect the proper functioning of the machine.

Larger quantities of water may even freeze up the refrigerant lines. This tendency of water to cause trouble by freezing generally necessitates its removal before a further possible consequence of its presence, corrosion, becomes important.

Not Inherently Corrosive

Methyl Chloride in itself is neither acid or corrosive and is manufactured to a specification of 0.001 per cent or less by weight of acid calculated as Hydrochloric Acid. Also, under ordinary conditions it will not form acid when in contact with water. Because of these points Methyl Chloride, as above stated, is essentially non-corrosive to the common engineering metals under ordinary conditions.

Zinc, aluminum, die castings may be classed as exceptions since in the presence of even small amounts of water some corrosion of these metals may take place. It should be remembered that in addition to water itself being corrosive, if Methyl Chloride and water are in contact over a long period of time at higher temperatures, as often exist in refrigerating compressors, they may form small amounts of acid and therefore cause corrosion. As was also stated above, ice formation generally first shows the need for drying and therefore this type of corrosion is rarely if ever experienced.

It is sometimes stated that water in Methyl Chloride systems is the cause of the trouble known as "copper plating" but, research and experience have traced this trouble to the use of unsuitable lubricants. Methyl Chloride in itself supports no galvanic action.

Although Methyl Chloride as purchased is of very low water content, being manufactured to a specification of 0.01 per cent or less by weight of water, in service practice it is advisable to dry a system after charging because of moisture that may be introduced in the charging process, moisture in the lubricant or moisture already present in the machine.

Avoiding Use of Chemical Dryers

In factory practice smaller machines can be efficiently dried before charging by means of a vacuum oven taking the entire assembly but this method is not available to the average service organization.

Fair results may be obtained by flushing with Methyl Alcohol (Methanol) and then blowing out with dry air, but it is best that even this be followed by chemical drying, as described below, after refrigerant has been charged. If air is not available, it is sometimes the practice to blow out the system with a little Methyl Chloride gas.

In general service practice chemical drying is sufficient unless very large quantities of water are present in a system, in which case the Methyl Alcohol flushing above described should be used.

Chemical Drying Agents

Whatever drying agent is employed, it is important that it be used in connection with an efficient filter such as mineral wool, so as to prevent passage of finely divided or disintegrated material into the refrigeration system. Also, the drying agent should be in the form of coarse granules.

It is not practicable to reactivate any of the drying agents that are used in refrigerating systems. Ordinarily, activated alumina and silica gel can be reactivated easily by heating, but in refrigeration work contamination by oil makes this impractical.

Various drying agents which have been used with Methyl Chloride will be considered separately in the following discussion.

Calcium Chloride

Anhydrous Calcium Chloride has been widely used as a drying agent

for Methyl Chloride systems, but with varying success. While there is no objection to it from the standpoint of drying efficiency, its use is not recommended because of its tendency to induce corrosion in the refrigeration system, especially at the expansion valve.

The sources of practically all cases of corrosion in Methyl Chloride systems have been traced to the use of Calcium Chloride as drying agent rather than to the effect of Methyl Chloride in the presence of moisture.

In spite of the foregoing facts, Calcium Chloride often has been and is being used without trouble for drying Methyl Chloride systems, but its use must be attended with special care. It should not be permitted to absorb more water than would form the monohydrate—an amount equal to 16.2 per cent by weight of the Calcium Chloride charge. Also, a Calcium Chloride dehydrator should not be left in the system for more than a few days.

One cannot expect acid to be removed from a refrigeration system by the use of Calcium Chloride since only a small and insufficient amount of alkali is present in the commercial grade that is generally used.

Calcium Oxide

Calcium Oxide is a very satisfactory drying agent for Methyl Chloride systems. It will not cause corrosion and as a matter of fact it may prevent corrosion by virtue of its ability to neutralize acid that may be in the system.

Its maximum water absorbing capacity is 32.1 per cent of its own weight, but it should not be depended upon to take up more than about half of this because of the desirability of being on the safe side and keeping the dryer in an efficient condition as well as its tendency to disintegrate to a fine powder on taking up water.

This latter tendency is its only disadvantage as the fine powder may pass into the refrigeration system unless an efficient filter is used.

When stored prior to using, Calcium Oxide should be kept in airtight cans not only because of its absorbing moisture from the air, but also because of its tendency to absorb Carbon Dioxide from the air to form Calcium Carbonate which has no drying properties. United States Patent 1,809,833 issued to Chicago Pneumatic Tool Co. claims the use of Calcium Oxide in refrigeration systems.

Soda Lime, which is a mixture of calcium Oxide and Caustic Soda, also has been reported as being very satisfactory for drying Methyl Chloride. It both absorbs water and neutralizes acid and in addition probably has much less tendency to disintegrate than does straight Calcium Oxide.

Activated Alumina

Activated Alumina, which is a special form of Aluminum Oxide, is a satisfactory drying agent for Methyl Chloride systems, but its moisture absorbing capacity is more limited than that of the above substances so that comparatively larger quantities must be used.

While its tendency to disintegrate to a fine dust is not as great as that of Calcium Oxide, nevertheless, as with all chemical drying agents, trouble may result if it is not used in conjunction with suitable filters.

It will not in itself induce corrosion, but it is probably of no particular use for acid removal. It is more expensive than the commoner drying agents.

Neither Magnesium Perchlorate nor Barium Perchlorate should be used as drying agents for Methyl Chloride as they may be the cause of dangerous explosions when employed for this purpose.

Methyl Alcohol

The use of Methyl Alcohol as an anti-freeze in Methyl Chloride systems is claimed by United States Patent 1,570,080 issued to Roscoe R. Stitt. Because Methyl Alcohol does not remove the water but leaves it in the system where it may be a source of corrosion, its use is recommended only as a temporary measure for opening up systems which may be

partly but not completely frozen up, with 2½ per cent Methyl Alcohol in Methyl Chloride recommended by the inventor.

It should be of a pure grade as acidic impurities might otherwise be introduced into the system. Its use should always be followed by removal of water with a drying agent and while this leaves the Alcohol in the system, its presence there will not be objectionable.

Various other drying agents have been suggested for Methyl Chloride, but there is not enough data available concerning them to enable us to unqualifiedly recommend any of them. Among these are the following:

Barium Oxide should have all the advantages of Calcium Oxide, to which it is chemically similar, but it is probably more expensive and, at least at present, not as universally available. It probably removes water more rapidly and more thoroughly than does Calcium Oxide. While it may have other advantages, they are not readily apparent.

Anhydrous Calcium Sulfate probably would be satisfactory from a drying standpoint but it would not neutralize acid. A combination of Anhydrous Calcium Sulfate and a small amount of Calcium Oxide would probably prove satisfactory.

Silica Gel is of a type similar to activated alumina. While it undoubtedly has good drying properties, it would not neutralize acid and is comparatively expensive.

Caustic Soda and Caustic Potash would dry and neutralize Methyl Chloride systems, but they probably would be unsatisfactory in refrigeration practice because of difficulty in handling and their tendency to quickly form water solutions.

Conclusions

Concluding, the drying of Methyl Chloride refrigeration systems so as

to remove excessive amounts of moisture is found advisable. Either Calcium Oxide or Soda Lime in coarse granular form and used in conjunction with a suitable container and filter will give satisfactory results.

Du Pont Laboratory To Test Products

WILMINGTON, Del.—E. I. du Pont de Nemours & Co. recently opened its new medical research laboratory to be known as the Haskell Laboratory of Industrial Toxicology, the purpose of which will be to test thoroughly, from a health standpoint, all products produced by the company before they are placed on the market.

The importance of the analyses and studies to be made will readily be understood by manufacturers who use du Pont products as raw materials in their business. It will mean that before new products are produced on a large scale and put on the market, they will be given a thorough examination and exhaustive study in regard to any potential danger which might exist, either on other industries during the process of manufacture or the effects on general consumers who may buy them from manufacturers.

The laboratory staff, du Pont claims, will be the largest and its equipment the most extensive of any laboratory in the world.

Its director is Dr. W. F. von Oettingen who received his chemical training at the University of Jena and Goettingen, Germany, and his doctor of philosophy degree at the University of Goettingen. Later he studied medicine and the relation between chemical constitution and pharmacological action. Finishing his pre-clinical course in Goettingen, he entered the University of Heidelberg, where he

specialized in internal medicine and pharmacology. He came to this country in 1924 and the following year joined the staff of the medical school of Western Reserve University in Cleveland.

Dr. von Oettingen is assisted by Dr. W. C. Hueper, a graduate in medicine from the University of Kiel, and who for six years was director of laboratories at Mercy Hospital, Chicago; by Dr. Frank W. Wiley, a graduate in chemical engineering from the University of Denver, who holds the National Research Council Fellowship at the University Hospital at Ann Arbor, Mich.; and others in charge of various phases of the work.

New Uses Reported for Porcelain Enamel

CLEVELAND—New uses for porcelain enamel are being found in the building field in the form of store fronts, service stations of oil companies, and steel fences.

Attention value is the basic reason for use of porcelain enamel, but oil companies use it chiefly because fabricated steel buildings with exteriors of porcelain enamel panels are expandable and portable.

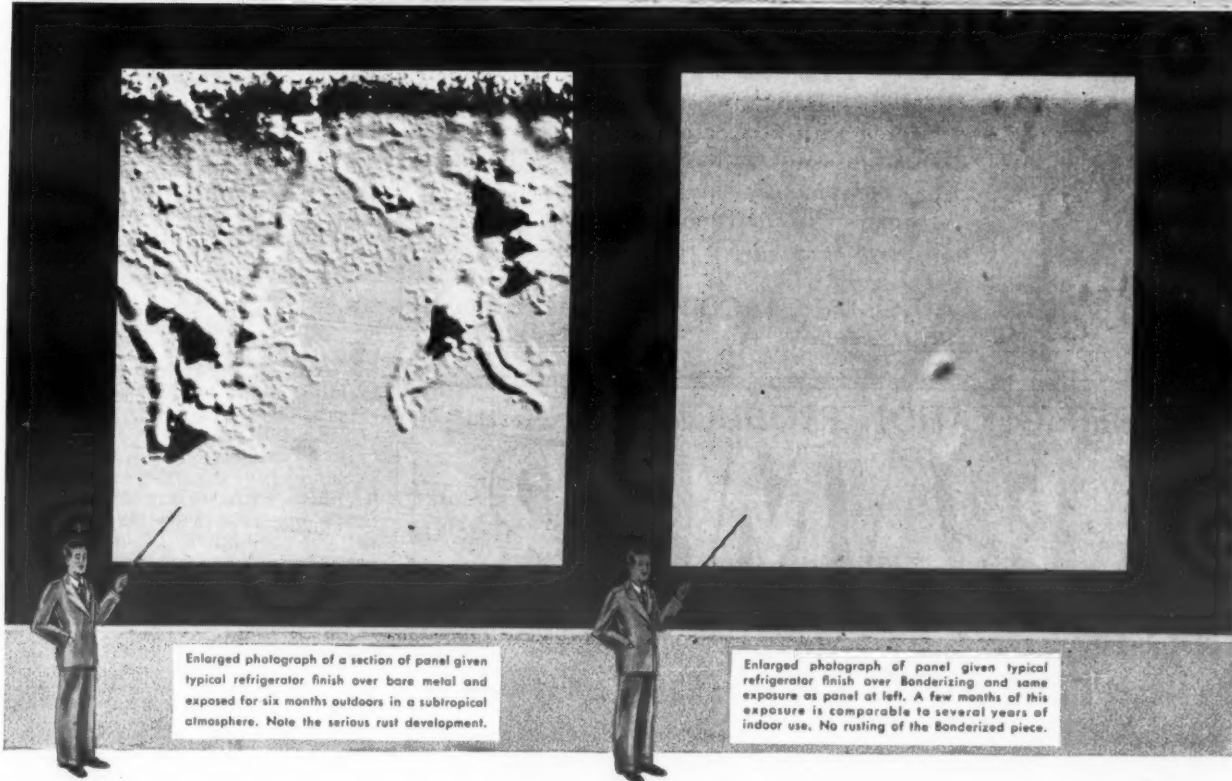
G-E Employs Conveyor Furnace for Parts

SCHENECTADY—General Electric's new mesh-belt conveyor-type furnace is being used in the manufacture of G-E electric refrigerators.

In the manufacture of G-E units, the new electric-furnace-brazing installation turns out steel assemblies of unique designs. These are brazed with copper.

The process is used for six different parts of the refrigerators.

THE EFFECTS OF Rust ON REFRIGERATOR FINISHES



Enlarged photograph of a section of panel given typical refrigerator finish over bare metal and exposed for six months outdoors in a sub-tropical atmosphere. Note the serious rust development.

Enlarged photograph of panel given typical refrigerator finish over Bonderizing and same exposure as panel at left. A few months of this exposure is comparable to several years of indoor use. No rusting of the Bonderized piece.

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rust starts and spreads from mar or scratch.

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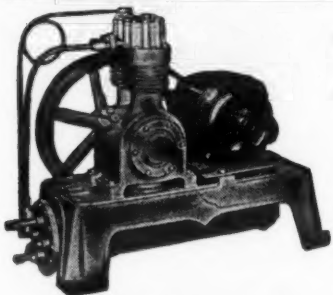
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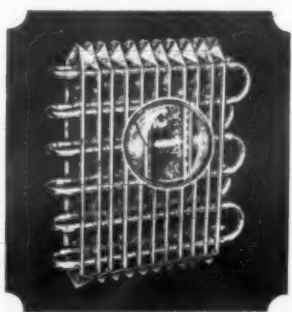
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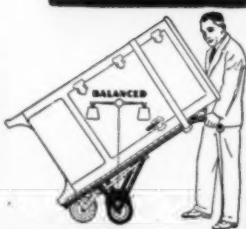
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Air Conditioning Attracts Intelligent Men



These action snapshots taken at the General Electric Air Conditioning Institute, are presented herewith to show the type of men that the air-conditioning industry is drawing into its ranks. (1) A. C. Roy, sales promotion manager of the G-E air-conditioning department, tells his men that they are in the most promising of the new industries. (2) E. C. Lewis and R. E. Mason of Schenectady, and George Swanberg of Manchester, N. H. (3) We don't know this man, but he is a good example of the fine, intelligent class of air-conditioning dealers.

G-E Builds Experimental House to Test Standardized-Room-Unit Construction

CLEVELAND — An experimental house of modern architecture, the result of a General Electric research project, and built to test the value and practicability of a standardized-room-unit method of residential construction, was formally opened recently at Nela Park, here.

The Nela Park house represents only the results of an experiment, General Electric officials made it clear. Purpose of the experiments was to ascertain:

(1) Whether it is possible to make certain changes which are necessary to secure a relatively low cost of construction, occupancy, and maintenance, and still have a structure with a reasonably good appearance;

(2) Whether these cost savings will be sufficient to equip the house with most of the worth while devices which help to save labor or enhance the comfort and convenience of living, so that the fully equipped structure will cost no more than those comparable structures which are less completely equipped;

(3) Whether the general plan and modifications of it are sufficiently good to justify many reproductions and so make many additional economies possible, not only in the structure itself, but also in much of the equipment used in it.

Many of the features of the Experimental House at Nela Park are the ideas of one man—T. W. French, formerly G-E vice president and manager of the incandescent lamp department, who recently retired and is now acting in an advisory capacity.

Some Fixed, Some Movable

Embodied in the design of the Experimental House is the fundamental precept of modern architecture that the external contour and design of a building shall be a true and logical expression of the internal functioning of that building. Any one house can only be a single answer to the big problem, but a series of designs can be made with certain fixed units and other movable, variable units which can be combined in many possible solutions. This conclusion was verified in the development of a standardized-room-unit method of design.

The living room of the Nela Park house expresses its importance in the family life with its high ceiling, large vertical windows, and its generous floor space; the dining room is part of the living room in that it forms the base of a letter "L" yet shows its reduced importance with a lower ceiling and smaller floor area.

Kitchen Placement and Equipment

The kitchen, carefully considered for every location of individual equipment, finds its place logically between the dining room and the utility room. This latter serves as a means of access to the front entrance hall, or of egress to the garage, basement, or outside door.

In the kitchen a General Electric dishwasher, a General Electric range, and a General Electric flat-top refrigerator have been installed as well as space for a planning desk. Special care has been given to kitchen electrical outlets and counter lighting. The utility room includes a package receiver, built into a storage closet. A gas-fired incinerator is used.

The half-basement, containing laundry trays, heating equipment, and toilet is placed only under the dining room, kitchen, and utility room, although provision is made for the possibility of excavating under the living room and using this space as a recreation room.

This then is the base unit, No. 1, the axis about which the remaining units are grouped in various combinations.

Unit No. 2 provides two bedrooms and two baths on the first floor, ac-

cess being through the dining room to a central hall.

No. 3 provides three bedrooms, two baths, a dressing room and a moth-proof storage closet for first floor location. The alternate modification of this unit proposes the dressing room and moth-proof closet areas as one room, which can be used for a health room, child's bedroom, or sewing room.

Second-Floor Unit

Unit No. 4 includes one bedroom, one bath, and ample storage space all on the second floor, reached by a stair from the front entrance hall. These rooms are placed above the dining room, kitchen, and utility room, so that there is no conflict with the high ceiling in the living room.

Unit No. 5 is made by the addition of another bedroom to Unit No. 4, the same being placed over a portion of the garage. It is quickly apparent that the finished house may be provided with one to five bedrooms, and the cost, of course, will vary according to the number included. The Nela Park house is a combination of base Unit No. 1 and Unit No. 3.

Exterior walls of the house are Haydite block, (a light-weight insulating concrete block), 12 inches thick in the basement and 8 inches elsewhere. Directly to this on the exterior surface is applied three coats of portland cement stucco.

On the interior surface wood furring strips are nailed to the Haydite blocks and to these strips rocklath, with aluminum foil insulating surface, and two coats of plaster applied.

Floors and roof are constructed with 2 in. x 12 in. wood joists, the garage roof also using 2 in. x 12 in. wood joists. The first floor has a single thickness pine floor to which a felt

padding and carpet are applied.

Linoleum floors are used in the baths, kitchen, and utility room.

The roof is surfaced with a four-ply tar and gravel roofing, similar to that in use on the best office and commercial buildings. All roofs are protected with four inches of mineral wool fill as insulation; drainage is provided by two cast iron downspouts located on the garage and bath room walls.

Interior Walls

The interior walls are 2 in. x 4 in. wood studs with rocklath and two coats of plaster. Built-in wardrobes and closets are used in the bedrooms to save floor space and for convenient use. A large linen closet is provided in the rear hall, as well as the moth-proof storage closet. A built-in coat closet is placed in the entrance hall. Built-in towel cabinets of ample size are located in the bathrooms.

All windows are steel casements, protected with bronze screens, and set in white pine frames.

Ventilating fans are provided in a small pent house on the kitchen roof to exhaust the kitchen fumes as well as special ventilating grille to the living room ceiling. Both fans are controlled by switches.

Heating is provided by a General Electric gas furnace. Copper fin-radiators are concealed in insulated boxes under windows, giving off the heat through grilles immediately under the window stools. Temperature control is by a thermostat located in the dining room.

Lighting is incorporated in all rooms by a central fixture and wall outlets, the central fixture being omitted only in the living room. Sufficient wall outlets have been installed to care for all possible normal uses. Call bell and buzzer have been installed in the hall, dining room, and utility room. Waterproof exterior outlets have been provided for burglar protection lighting, as well as decorative effects for the Christmas season.

How To Service Orphan Refrigerators

Absopure Commercial

Drawings and service data on both Series E and F Absopure compressors, also of the Absopure float, header assembly, oil gauge, discharge and intake valves, and expansion valve. (July 18, 25, & Aug. 1, 1934.)

Allison Household

Detailed service instructions, with views of the two-stage compressor, float valve, flooded evaporator, check valve, etc. of this early household machine using ethyl chloride. Analysis of service calls. (May 30 & June 6, 1934.)

Belding-Hall Electric

Operating cycle of the high-side float system using sulphur dioxide and the unique Electric gear pump compressor. Drawings of service manifold, cast-iron cooling unit, thermostat, and electrical wiring. (Aug. 22 & 29, 1934.)

Holmes Household

Complete description of the ethyl chloride system built by Holmes Products, Inc. Illustrations of the compressor, float valve, charging valve in three positions, check valve, circuit breaker, and cooling unit, and service helps. (Oct. 10, 17 & 24, 1934.)

Iceberg Household

Service helps on Iceberg self-contained household refrigerators and water coolers, both of which used a reciprocating compressor and methyl chloride. (Aug. 8, 1934.)

Iroquois

Complete installation and service instructions on the Iroquois ethyl chloride household machine, with illustration of compressor construction and controls. (Feb. 20 & 27, 1935.)

Majestic Standard

Operating cycle, section of compressor, suction and discharge valves, float

valve assembly, control assemblies, thermostat, and method of installing evaporator illustrated in a series of three lengthy articles on Grigsby-Grunow's conventional "open" type refrigerator. (Sept. 12, 19 & 26, 1934.)

Majestic Hermetic

Detailed description of all the principal parts of Grigsby-Grunow's hermetically sealed units, and instructions for all service operations which may be conducted in the field. (Aug. 16, 1933.)

Rice Household

Data on the Rice household machines in which methyl chloride was the refrigerant. Discussion of common service troubles encountered with the capillary tube. (July 4, 1934.)

U.S. Hermetic

Service discussion of the direct-driven, sulphur dioxide hermetic machine built by the U. S. Radio & Television Corp. Phantom view of the refrigerating unit and electrical wiring diagram. (Aug. 15, 1934.)

Wayne Household

Description of all major parts in the Wayne household machine, and instructions for performing all common service operations. Illustrations of the complete system, double-sealed valve assembly, section of the compressor, and expansion valve. (July 11, 1934.)

Welsbach Household

Complete treatise on the Welsbach ethyl chloride household machine, with illustrations of compressor, expansion valve, receiver valve, condenser shut-off valve, compressor inlet valve, thermostat, and two types of Welsbach controls. (June 13, 20 & 27, 1934.)

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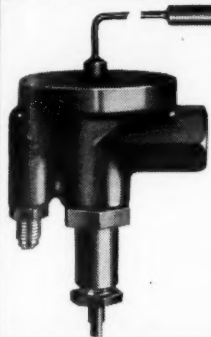
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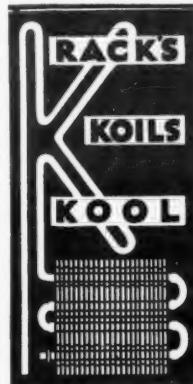
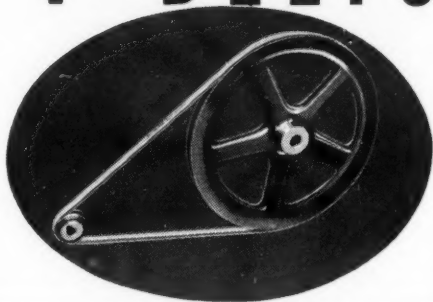
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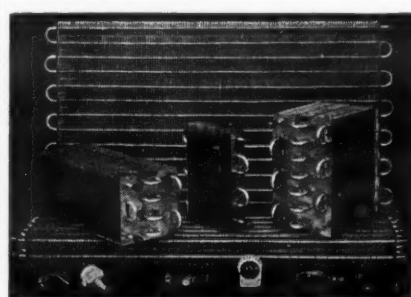
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Answer: We have not yet made a survey which shows the percentage of sales of household electric refrigerators made by public utilities during 1934. However, we do have estimates of the business done by public utilities for several past years.

In 1926 it was estimated that utility merchandising organizations made 19 per cent of all refrigerator sales; in 1927, 18.9 per cent; in 1928, 19 per cent; in 1929, 24.2 per cent; in 1930, 27.8 per cent; in 1931, 18.1 per cent; in 1932, 12.9 per cent; in 1933, 14.6 per cent.

It is quite possible that we will have the record for 1934 for publication in the 1935 REFRIGERATION MARKET DATA BOOK, which will be available in about a month.

Number of Manufacturers

No. 2099 (Manufacturer, Missouri)—“Can you give us the approximate number of manufacturers making electrical household refrigerators?”

Answer: Questionnaires returned for the 1935 REFRIGERATION DIRECTORY AND MARKET DATA BOOK indicate that the total number of manufacturers of complete household electric refrigerators active at the present time is between 45 and 50.

Artificial Ice Cubes

No. 2100 (Manufacturer, Ohio)—“Please mail tonight list of artificial ice cube manufacturers.”

Answer: Nowhere in our files do we seem to have any information on manufacturers of glass ice cubes to be used for display purposes. Can any reader tell us.

Service in Earp, Calif.

No. 2101 (Manufacturer, Pennsylvania)—“We are interested in contacting some refrigeration service men or service companies in the vicinity of Earp, Calif., and have been unable to locate anyone nearer to Earp than Los Angeles, which is approximately 300 miles away. Would it be possible for you to advise us the names of any service organizations in that part of California.”

“We believe at one time you published a list of service companies located all over the country, but we apparently have mislaid our copy, and if possible would like to obtain a copy of that list, in addition to the above information.”

Answer: None of record. At the present time, we are compiling a complete list of independent service companies, and will appreciate the help of readers in furnishing us with names and addresses of reliable firms. (See announcement regarding new “Service Section” of the 1935 REFRIGERATION DIRECTORY on front page of this issue.)

Data for School Course

No. 2102 (Utility Company, Indiana)—“Our home service department is cooperating with the local school system on the planning of a course of study of household appliances which includes that of electric refrigeration. We are very much in need of data on different types of refrigeration available.”

“I am wondering if you have some literature on this subject; literature regarding the type of unit and motor, type of refrigerant used, insulation, etc.”

“I would appreciate it very much if you would send me all of the literature which would be appropriate for the arranging of such a course.”

Answer: Specifications giving detailed data on 1934 models of all leading makes of household electric refrigerators were published in the May 30, 1934, issue of ELECTRIC REFRIGERATION NEWS. Back issues of the NEWS are available at a cost of 10 cents each.

Specifications for all 1935 models of all makes of household electric refrigerators will be published in the March 20 issue.

The 1935 REFRIGERATION DIRECTORY AND MARKET DATA BOOK should be of great help to you in the preparation of your course on household appliances. This book will give names and addresses of all manufacturers of electric refrigeration equipment, all available statistics and market data on electric refrigerators, a review of industry development and history.

Real Property Survey

No. 2103 (Publisher, New York City)—“It has come to my attention that

not so long ago you published information relative to types of refrigeration in homes. The information, as I got it, was used in connection with some census figures. Would you send me these data?”

Answer: We believe that you must have in mind the real property inventory for 1934 which was a survey conducted in 64 American cities by the Bureau of Foreign and Domestic Commerce. This survey gave a tabulation of the number of homes or dwelling units owning household mechanical refrigerators, showing information for each of the 64 cities covered.

Results of the survey were published in the following 1934 issues of ELECTRIC REFRIGERATION NEWS: May 23, 1934; June 20, 1934; July 11, 1934; Oct. 10, 1934; and Jan. 2, 1935.

Dover Refrigerator

No. 2104 (Manufacturer, Ohio)—“We have received a request for information on the Dover refrigerator. We have not heard of a refrigerator by that name being on the market and if there is one and you have any information on it such as name of manufacturer, models in the line, and price range, we would appreciate receiving it.”

Answer: We have been unable to locate any record of the Dover refrigerator, either as a present product or as having been manufactured in the past. Can any reader supply information?

Electrolux-Made Coldspot

No. 2105 (Dealer, Texas)—“Will you find out if Electrolux is still making refrigerators for Sears Roebuck?”

Answer: To the best of our knowledge Electrolux is no longer making refrigerators for Sears, Roebuck & Co. The contract was supposedly terminated last July.

Coin Meters

No. 2106 (Distributor, Louisiana)—“Will you please supply me with the names of several companies making coin meters suitable for use with electric refrigerators?”

Answer: See below.

No. 2107 (Distributor, Connecticut)—“I understand that you have some information available as to meters for use with electric refrigerators. We are distributors in New England, and we have been referred to you for the information as to make and cost.”

Answer: See below.

No. 2108 (Distributor, Minnesota)—“A hardware company has written us relative to meters which can be attached to washing machines wherein the customer deposits 10 cents to 25 cents in the meter to operate the machine.”

Answer: Manufacturers of coin meters and coin electric clocks are as follows:

General Electric Co., Schenectady, N. Y.
Coin-A-Day
Eltime Clock Co. Div.
Electric Auto-Lite Co., Toledo, Ohio.
Budgetklok Co.
915 Washington Ave., Minneapolis, Minn.
International Register Co.
15 S. Throop St., Chicago, Ill.
Landis & Gyr, Inc.
104 Fifth Ave., New York, N. Y.
Mills Novelty Co.
4100 Fullerton Ave., Chicago, Ill.
Frank Pierman, Ottawa, Ohio.
Seeburg Corp.
1510 Dayton St., Chicago, Ill.
Zell Products Corp.
536 Broadway, New York, N. Y.

An 18x12x12 in. Unit

No. 2109 (Dealer, Louisiana)—“A customer of ours is interested in securing a miniature electric refrigerator with two ice cube trays. The exterior dimensions of this cabinet he claims are about 18 in. high, 12 in. wide, and 12 in. deep. The cooling unit to be in the top corner.”

“He states that he has seen this type on the West Coast and that they retail for from \$65 up.”

“Here in New Orleans we have never seen or heard of any such type refrigerator and we would appreciate your advising us of the manufacturer of such an item.”

“For your further information, he would like it to be installed in a home built-in bar just giving him about 40 ice cubes and enough space to chill maybe 10 or 12 glasses.”

Answer: We have not seen such a unit and have received no literature describing a model of this size. Can any reader help?

List of Manufacturers

No. 2110 (Manufacturer, Illinois)—“The Edison Co. of Chicago, to whom we made application for a list of electric refrigerator manufacturers in the United States, referred us to you for this information.”

Answer: See below.

No. 2111 (Technical Employment Agency, New York)—“We have available the services of a number of men who have had varied experience in

CLASSIFIED

RATES: Fifty words or less, one insertion \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS AVAILABLE

COMMERCIAL refrigeration sales engineer to contact distributors and assist in office detail. Ohio and West Pennsylvania territory. Engineering knowledge and previous experience this type of work essential. This position is with one of the largest manufacturers of refrigeration and air conditioning equipment, affording a profitable connection to the right man. Members of our organization know of this ad. Box 686, Electric Refrigeration News.

POSITIONS WANTED

SALES PROMOTION or Assistant Advertising Manager, 35, for refrigeration-radio manufacturer. Radio, all phases since 1915; ten years successful specialty dealer refrigerators, washers, radio, oil burners. Three years department store and wholesale experience. Thorough knowledge advertising, merchandising distribution. Creative planning type. Would serve as field representative or district manager. Box 680, Electric Refrigeration News.

SALES MANAGER desires connection with large refrigeration, radio and appliance dealer or distributor. Thoroughly experienced in organizing and training salesmen; practical inexpensive methods of supplying them daily with qualified prospects. Developed present retail connection to \$20,000.00 monthly. Prefer commission. Confidential exchange of communication and references. Box 683, Electric Refrigeration News.

INSTALLATION and service man, commercial and domestic experience. Married. 5½ years experience managing service department. Kelvinator factory trained. Desires steady position with manufacturer, distributor or dealer. Experienced electrician. Can furnish references. Will locate anywhere. Prefer Eastern or Southern states. Box 684, Electric Refrigeration News.

SALES EXECUTIVE with many years of successful factory and jobbing experience, particularly refrigeration, radio, and air conditioning, is desirous of corresponding with manufacturers who might be interested in the services of one who understands wholesale and retail merchandising thoroughly. At present employed. Will consider locating anywhere. Replies confidential. Box 685, Electric Refrigeration News.

FRANCHISE WANTED

MANUFACTURERS, DISTRIBUTORS, DEALERS, etc.—Are you looking for a refrigeration service engineer to take care of your business in Canal Zone, Panama? A graduate of Herkimer Institute, I am at your service. Literature, catalogs, dealer's discount accepted. Commission or any other basis considered. Box 682 Electric Refrigeration News.

EQUIPMENT FOR SALE

A WELL-ESTABLISHED independent refrigeration sales and service corporation, with completely equipped showroom and shop for rebuilding, situated in the metropolitan area of New York City, 4½ years in the same location, for sale with complete stock of parts and units. Box 677, Electric Refrigeration News.

EQUIPMENT WANTED

WANTED—Discarded or non-operating Hermetically sealed Majestic Units for cash. Or will replace such units with repaired units at lowest prices. Write full details of what you have. Carl John Stein Co., 122 W. Illinois St., Chicago.

REPAIRS

HALELECTRIC thermostat repair service. H & B, G.E., Cutler-Hammer, Penn. Ranco, Tag., etc. Expansion valves repaired. Gas service, Ethyl, Methyl, Iso-Butane, Sulphur. Your cylinder or ours. Competitive prices. Halclectric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. Van Deventer (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

SCHOOLS

MEN: Train for Refrigeration and Air Conditioning, at home, using same text material you would use in best resident school. Supervised individual instruction under licensed teacher with Doctor's degree. Shook School, Alton, Ill.

the electric refrigeration field. We feel that if it were possible to obtain a list of the manufacturers of these units, it would be possible for us to assist in obtaining employment for some of these men.”

Answer: Manufacturers of complete household electric refrigerators are listed on page 262 of the 1934 REFRIGERATION DIRECTORY AND MARKET DATA BOOK which you will find in the New York Public Library at 42nd St. & Fifth Ave., or in the office of any distributor of electric refrigerators.

This list will be brought up to date in the 1935 REFRIGERATION DIRECTORY AND MARKET DATA BOOK, which will be ready for distribution in the very near future.